NFTs for Beginners

Understand how NFTs are revolutionizing the concept of digital ownership

Rajan Arya

bpb

NFTs for Beginners

Understand how NFTs are revolutionizing the concept of digital ownership

Rajan Arya

bpb

NFTs
for
Beginners

Understand how NFTs are revolutionizing the concept of digital ownership

Rajan Arya

www.bpbonline.com

Copyright © 2023 BPB Online

All rights reserved. No part of this book may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, without the prior written permission of the publisher, except in the case of brief quotations embedded in critical articles or reviews.

Every effort has been made in the preparation of this book to ensure the accuracy of the information presented. However, the information contained in this book is sold without warranty, either express or implied. Neither the author, nor BPB Online or its dealers and distributors, will be held liable for any damages caused or alleged to have been caused directly or indirectly by this book.

BPB Online has endeavored to provide trademark information about all of the companies and products mentioned in this book by the appropriate use of capitals. However, BPB Online cannot guarantee the accuracy of this information.

First published: 2023

Published by BPB Online

WeWork

119 Marylebone Road

London NW1 5PU

UK | UAE | INDIA | SINGAPORE

ISBN 978-93-5551-786-9

www.bpbonline.com

Dedicated to

My parents

Ved Parkash Arya *&*
Neeru Arya

My beloved wife:

Preeti Arya *&*
My Son ***Vedant Arya***

About the Author

Rajan Arya is a highly accomplished technology entrepreneur and digital transformation expert with over 14 years of experience in the industry. He has founded several technology-based startups, including universitybureau.com, IeltsBureau.com, Countryroof.com, motortiger.com, serverscientist.com, Healthcadre.com, and internetkeeda.com and many more. All of these startups have gained tremendous success under his leadership.

Rajan's passion for digital transformation has led him to work with international MNCs, where he gained extensive knowledge and experience in the field. He has also authored several books on business and technology that have helped many entrepreneurs achieve success.

Apart from his professional life, Rajan is a socially conscious person and believes in launching businesses that can positively impact society. His business ventures are aimed at providing solutions that make people's lives easier.

In his spare time, Rajan loves to travel and read books. He is an avid reader and enjoys exploring new cultures and places. Rajan's dedication to his work and his commitment to making a positive impact on society make him an inspiration to many aspiring entrepreneurs.

About the Reviewer

Pradeep Selvaraj is a highly skilled and seasoned 3D Website oriented Metaverse and NFT developer with over 15 years of IT experience.

He is a certified Tensorflow Developer from Google, certified blockchain developer from the Blockchain Council, and Data Alchemist from Covalent, making him a recognized expert in this field. His passion for emerging technologies has led him to become an authority in the blockchain space, making him the perfect candidate to review this book.

With their extensive knowledge of blockchain and AI, our reviewer is able to offer a unique perspective on the subject matter, providing readers with a comprehensive and insightful analysis. Whether you're a seasoned professional or a newcomer to the world of blockchain, our reviewer's insights are sure to provide valuable guidance and expertise.

He is currently researching and developing a blockchain based search engine for NFTs and Metaverse, decemeve.io which will be released in Q3, 2023.

Acknowledgement

I want to offer my sincere gratitude to my family and friends, especially my parents Ved Parkash Arya and Neeru Arya, my wife Preeti Arya and my son Vedant Arya, for their unfailing support and encouragement throughout the writing of this book.

I'm also appreciative of BPB Publishing for their advice and know-how in helping me finish this book. This book had a lengthy revision process that benefited greatly from the participation and cooperation of editors, technical specialists, and reviewers.

Finally, I want to express my gratitude to all the readers who have shown interest in and support for my book. Your words of support have been so helpful.

Preface

Welcome to the exciting world of Non-Fungible Tokens (NFTs). NFTs are the newest addition to the world of cryptocurrencies, digital assets, and blockchain technology. They have been gaining immense popularity in recent times due to their uniqueness, scarcity, and the ability to verify ownership.

This book is designed to provide an in-depth understanding of NFTs, their uses, advantages, and the various aspects associated with them. The book is divided into nine chapters, each of which covers a different aspect of NFTs.

Chapter 1: Introduction to Non-Fungible Tokens

This chapter provides an introduction to NFTs, their types, elements, uses, and how they work. It also covers aspects such as planning to buy NFTs, why to buy NFTs, and NFTs as an investment.

Chapter 2: Understanding Tokens, Fungible and Non-Fungible

This chapter delves into the basics of tokens, their significance, and the concepts of fungibility and non-fungibility. It also compares tokens, fungibility, and non-fungibility, and covers token standards, Ethereum tokens, and Tezos tokens.

Chapter 3: About NFTs

This chapter covers the importance of NFTs, the value of collectibles, problems with traditional art, collectibles, and memorabilia, digital art before NFTs, advantages of NFTs, and the story of digital art. It also provides an introduction to Non-Fungible Kitties, wallets, MetaMask, and Coinbase.

Chapter 4: Understanding the Game of NFTs

This chapter covers the ins and outs of buying NFTs, the risks of MetaMask, and how to install and secure your MetaMask wallet. It also covers the need for buying Ether for the MetaMask wallet.

Chapter 5: NFTs: A Cryptocurrency

This chapter discusses whether NFTs are a cryptocurrency or not, NFT investing, and NFT investing strategies.

Chapter 6: NFTs Marketplaces

This chapter covers various NFT marketplaces such as OpenSea, Axie Infinity, CryptoPunks, NBA Top Shot, Rarible, Nifty Gateway, SuperRare, Alcor NFT, Wax (Atomic hub), Foundation, VeVe, Crypto.com, and Binance.

Chapter 7: Security of NFTs

This chapter covers various security issues associated with NFTs such as re-entrant attacks, blockchain-related issues, DOS attacks, spoofing, information leakage, and tampering.

Chapter 8: Creating, Buying, Selling, and Mining NFTs

This chapter covers the process of creating an account, funding an account, creating NFTs, the cost of creating NFTs, who can make NFTs, how to sell NFTs, and the process of selling NFTs.

Chapter 9: Legal Aspects and Future of NFTs

This chapter covers various legal aspects associated with NFTs such as NFT securities, intellectual property rights, the right of publicity, the right of privacy, contracts, and taxes. It also covers the anatomy of NFTs, property rights of NFTs, NFTs and digital property, NFTs and real property, the metaverse, non-bankable assets, and digital wallets.

In conclusion, this book is an excellent resource for anyone who wants to learn about NFTs and their various aspects. Whether you are a collector, investor, or a curious learner, this book will provide you with an in-depth understanding of NFTs and their future.

Coloured Images

Please follow the link to download the
Coloured Images of the book:

https://rebrand.ly/25y8o6r

We have code bundles from our rich catalogue of books and videos available at **https://github.com/bpbpublications**. Check them out!

Errata

We take immense pride in our work at BPB Publications and follow best practices to ensure the accuracy of our content to provide with an indulging reading experience to our subscribers. Our readers are our mirrors, and we use their inputs to reflect and improve upon human errors, if any, that may have occurred during the publishing processes involved. To let us maintain the quality and help us reach out to any readers who might be having difficulties due to any unforeseen errors, please write to us at :

errata@bpbonline.com

Your support, suggestions and feedbacks are highly appreciated by the BPB Publications' Family.

Did you know that BPB offers eBook versions of every book published, with PDF and ePub files available? You can upgrade to the eBook version at **www.bpbonline.com** and as a print book customer, you are entitled to a discount on the eBook copy. Get in touch with us at: **business@bpbonline.com** for more details.

At **www.bpbonline.com**, you can also read a collection of free

technical articles, sign up for a range of free newsletters, and receive exclusive discounts and offers on BPB books and eBooks.

Piracy

If you come across any illegal copies of our works in any form on the internet, we would be grateful if you would provide us with the location address or website name. Please contact us at **business@bpbonline.com** with a link to the material.

If you are interested in becoming an author

If there is a topic that you have expertise in, and you are interested in either writing or contributing to a book, please visit **www.bpbonline.com**. We have worked with thousands of developers and tech professionals, just like you, to help them share their insights with the global tech community. You can make a general application, apply for a specific hot topic that we are recruiting an author for, or submit your own idea.

Reviews

Please leave a review. Once you have read and used this book, why not leave a review on the site that you purchased it from? Potential readers can then see and use your unbiased opinion to make purchase decisions. We at BPB can understand what you think about our products, and our authors can see your feedback on their book. Thank you!

For more information about BPB, please visit **www.bpbonline.com**.

Join our book's Discord space

Join the book's Discord Workspace for Latest updates, Offers, Tech happenings around the world, New Release and Sessions with the Authors:

https://discord.bpbonline.com

Table of Contents

1. Introduction to Non-Fungible Tokens

- Structure
- Objectives
- Introduction to NFTs
  - *Understanding the meaning of NFTs*
  - *Characteristics of NFTs*
  - *Features of NFTs*
- Types of NFTs
- Elements of NFTs
- Uses of NFTs
- Working of NFTs
- NFTs ownership rights
  - *Trading of NFTs*
  - *Planning to buy NFTs*
- Buying, creating, and selling NFTs
  - *Buying NFTs*
  - *Creating NFTs*
  - *Selling NFTs*
  - *Pros and Cons of NFTs*
- Ideal investment as NFTs
- Technical aspects of NFTs
- Start your journey with NFTs
- Conclusion
- Key terms
- Multiple Choice Questions
  - *Answers*

2. Understanding Tokens, Fungible and Non-Fungible

- Structure
- Objectives
- Introduction to tokens
  - *Definition of token*

Working of Crypto tokens
Detailed working of Crypto tokens
Structure of token
Examples of Crypto assets
Translation of digital tokens into real money
Importance of tokens in the financial business
Tokens: a potential threat
Use of equity tokens
Benefits of an equity token
Purpose of asset tokens
Benefits of asset tokens
Significance of tokens
Understanding the term fungible and non-fungibility
Fungible and nonfungible tokens
How tokens are different from cryptocurrencies
Meaning of fungible and nonfungible tokens in blockchain
Foundation for comparing fungible and non-fungible tokens
Difference between fungible and non-fungible tokens
Token standards
Token standard ERC20
Token standard ERC721
Token standard ERC777
Token standard ERC1155
Token standards for other blockchains
Token standards for Tezos
Ethereum token
What is an Ethereum token?
ERC-20
Conclusion
Key Terms
Multiple Choice Questions
Answers

3. About NFTs
Structure
Objectives
Importance of NFTs

Value of collectibles
Digital art before NFTs
When the Internet meets digital art
Art that pushes boundaries
Advantages of NFTs
Beginning of NFTs
The history of non-fungible tokens
Colored coins, 2012-2013
Counterparty 2014
Spells of genesis on counterparty in 2015
Trading cards on counterparty in 2016
Rare pepes on counterparty in 2016
CryptoPunks in 2017
The NFT explosion, 2018-2021
The first NFT
Andy Warhol presents pop art
Beeple's cyberpunk worlds meet NFTs
Utilizing three wallets to sell it from one to the other
History of digital art
Digital art: a real art
Purpose of digital art
Advantages and disadvantages of digital art
CryptoKitty
Working of CryptoKitties
Things to know before buying CryptoKitty
Offer
Breeding
Selling or siring
Buying a Cryptokitty
Introduction to the wallet
Different types of digital wallets
Top 5 NFT wallets
Benefits of using an NFT wallet
Things to consider when looking for the finest NFT wallet
Setup a Crypto wallet
Hosted wallets
Steps to set up a hosted wallet

Self-custody wallets
Need for a non-custodial wallet
Hardware wallets
Conclusion
Key Terms
Multiple choice questions
Answers

4. Understand the Game of NFTs
Structure
Objectives
NFTs games
Working of NFT games
Play-to-earn NFT games
NFTs in-game
Revenue model for NFT games
NFT popular games
Metamask
Get started using MetaMask
Benefits of MetaMask
Drawbacks of MetaMask
Alternatives to MetaMask
MetaMask's prospects
Risk of MetaMask
MetaMask - A secure program
MetaMask in the news in 2022
Install, use, and secure your MetaMask wallet
Step-by-step guide on using MetaMask
Usage of Seed phrase to backup and restore the wallet
Secure your MetaMask wallet
Conclusion
Key terms
Multiple Choice Questions
Answers

5. NFTs: A Cryptocurrency
Structure

Objectives
NFTs: A cryptocurrency or not
The meaning of NFTs
A refresher on blockchain
NFTs and their science
NFT vs Crypto
The ABCs of Crypto
The Heck of NFTs
The 'F' in 'NFT'
Related, but different
Investing in NFTs
Steps to invest in NFTs
Regulated use of NFTs
Legal issues, taxation aspects, and more
NFT regulatory challenges and concerns
NFTs as commodities
NFTs as securities
NFTs as intellectual properties
Current NFT regulation laws and standards
NFTs are governed by anti-money laundering regulations
State laws governing virtual currency apply to NFTs
NFTs and consumer law
Legal concerns with NFT that you should be aware of
NFTs and intellectual property rights
The risk to cybersecurity is increased by NFTs
Takeover of an account
Are NFTs a wise investment?
Investing in NFTs
NFT investing strategies
Investing in NFTs is a wise move
Make money with NFT
Top 7 NFT trading strategies
Profit in NFT investments
Conclusion
Key terms
Multiple Choice Questions
Answers

6. NFTs Marketplaces
- Structure
- Objectives
- Introduction to NFTs Marketplaces
- NFTs Marketplaces
  - *NFT Marketplace features*
  - *Important spots in the NFT marketplace*
  - *Important specifications to look for in an NFT Marketplace*
  - *Working of NFT marketplaces*
  - *Creating an NFT marketplace*
  - *Types of NFT marketplaces*
- OpenSea
    - *Selling an NFT using OpenSea*
- Rarible
- AtomicMarket
- NBA Top Shot
- Nifty gateway
- SuperRare
- Alcor NFT/Alcor Exchange
- Wax (Atomic hub)
- Foundation
- VeVe
- Crypto.com
- Magic Eden
- Binance
  - *NFT fees on Binance*
- Tips for selecting NFTs Marketplaces
- Conclusion
- Key terms
- Multiple choice questions
  - *Answers*

7. Security of NFTs
- Structure
- Objectives
- NFTs security
  - *Working of NFTs*

Are NFTs safe?
Understanding NFTs' possible threats
Possible NFTs security solutions (how to secure NFTs)
Software and hot storage crypto wallets
Hardware and cold crypto wallets
The future of NFTs
Re-entrant attack
Smart contract reentrancy attacks
Taking advantage of our smart contract
Reentrancy attack: A significant problem
Working of a reentrancy attack
Protecting smart contracts against a reentrancy attack
Blockchain-related issues
DOS attack
DoS attack example
Spoofing
Bots continue to be a big problem
Information leakage
The function of private keys
Security flaws in NFTs must be fixed
Tampering
The risks of data tampering
How to keep your assets safe
Protecting against a hack of your NFT
Tips to keep your digital assets safe
An NFT could be taken
NFTs: How are they robbed
Preventing the theft of your NFTs
Recovering a stolen NFT
Conclusion
Key terms
Multiple Choice Questions
Answers

8. Creating, Buying, Selling, and Mining NFTs
Introduction
Structure

Objectives
Creating and funding your account
NFTs explained
NFT artwork is rarely stored on the blockchain
Selling an NFT
Choosing a platform to sell your NFT
Option of minting NFTs
Vox media's gaming-focused outlet - polygon
Using a marketplace
Setting up a wallet
Connecting your wallet
Creating an NFT
Listing an NFT on OpenSea
Listing an NFT on Rarible
Using your NFT
Conclusion
Key terms
Multiple choice questions
Answers

9. Legal Aspects and Future of NFTs
Introduction
Structure
Objectives
NFTs securities
United States and NFT securities
United Kingdom and NFTs
Hong Kong
China
Intellectual Property Rights
Possibility of forging NFTs
Using NFTs as a counterfeit protection
Right to Publicity
Right of Privacy
Contracts
Taxes
Understanding the anatomy of NFT

Property rights of NFTs
NFTs and digital property
NFTs and real property
Metaverse
Non-bankable assets
Digital wallets
Conclusion
Key terms
Multiple Choice Questions
Answers

Index

CHAPTER 1

Introduction to Non-Fungible Tokens

A non-fungible token (NFT) is a non-interchangeable unit of data which is stored on a blockchain. It is a form of digital ledger which can be sold and traded. NFT data units can be associated with digital files, including photos, videos, and audio.

NFTs are different from blockchain as their token is uniquely identifiable and differs from blockchain crypttocurrencies, such as Bitcoin.

The public certificate of authenticity or proof of ownership provided by NFT ledgers is a public certificate of authenticity or proof of ownership. Because NFTs do not prohibit or forbid the creation, sharing, or copying of underlying digital files with identical associated files, their legal rights might be ambiguous.

By now, you have understood what NFTs are, so let us begin our journey and start exploring more about NFTs.

Structure

In this chapter, we will cover the following topics:

- Introduction to NFTs
- Types of NFTs
- Elements of NFTs
- Uses of NFTs
- Working of NFTs
- NFTs ownership rights
- Buying, creating, and selling NFTs
- Pros and Cons of NFTs
- Ideal investment as NFTs
- Technical aspects of NFTs

- Start your journey with NFTs

Objectives

After studying this chapter, you should be able to understand NFTs, their types, elements, uses, and aspects. You will also know how NFTs work and why to buy them. You will learn about NFTs as an investment.

Introduction to NFTs

An NFT is a digital asset which depicts real-world elements like art, in-game items, video, and music. Digital assets can be bought and traded online, often by using cryptocurrency and encoded by using blockchain technology.

NFTs are becoming increasingly popular as a means of purchasing and selling digital artwork. NFTs have unique identifying codes. *Figure 1.1* describes the token of NFTs:

Figure 1.1: *NFT Token*

Understanding the meaning of NFTs

Non-Fungible Tokens (NFTs) are not fungible like cryptocurrencies. NFTs

are unique and indivisible digital assets that represent ownership of a specific item, such as a piece of artwork or a collectible.

In contrast, cryptocurrencies like Bitcoin or Ethereum are fungible, which means that each unit is interchangeable and has the same value as any other unit of the same currency.

So, NFTs are not like physical money in that they are not fungible and cannot be exchanged on a one-to-one basis. Instead, each NFT is unique and has its own distinct value based on its specific attributes and ownership history.

Consider the following scenario:

- The value of one bitcoin is the same as another bitcoin's value.
- One ether unit is always the same as another ether unit.

Cryptocurrencies are a safe medium of exchange in the digital economy because of their fungibility.

NFTs change the crypto paradigm by making each token one-of-a-kind and irreplaceable, implying that one non-fungible token cannot be substituted for another. They're digital representations of assets related to digital passports since each token has a unique, non-transferable identity that distinguishes it from others. NFTs are also extendable, which means you may "breed" them together to create a third, unique NFT.

CryptoKitties is a popular example of an NFT. It is a blockchain-based game where players can buy, sell, and breed unique digital cats. Each cat is represented by a unique NFT, which is stored on the Ethereum blockchain and can be bought and sold just like any other digital asset.

CryptoKitties is a good example of how NFTs can be used to represent unique digital assets and how ownership of these assets can be easily transferred and tracked using blockchain technology. The success of CryptoKitties has also inspired other NFT-based games and collectibles, further demonstrating the potential for NFTs in the digital world.

NFTs, like Bitcoin, provide ownership data that may be used to identify and transfer ownership between token holders. In NFTs, owners can add information or attributes related to the asset.

By now, you have understood that NFTs are unique items that are verified and secured by a blockchain. It uses the same technology as used for cryptocurrencies. NFTs provide the authenticity of origin, ownership, and

uniqueness.

ERC721 and ERC20 are both standards for tokens on the Ethereum blockchain. However, they differ in their purpose and function.

ERC20 is a standard for fungible tokens, which means that all tokens under this standard have the same value and can be easily interchanged. This standard is commonly used for cryptocurrencies, Stablecoins, and other digital assets that are meant to be used as a medium of exchange.

ERC721, on the other hand, is a standard for non-fungible tokens, which represent unique and indivisible assets such as collectibles, artwork, and in-game items. Each token under this standard is unique and has its own distinct value, making it different from other tokens.

In summary, ERC20 is used for fungible tokens that can be easily exchanged and have the same value, while ERC721 is used for non-fungible tokens that represent unique and indivisible assets.

Characteristics of NFTs

The characteristics of NFTs are as follows:

- An NFT is a data unit that can be sold and exchanged on the digital market and is recorded on a digital ledger called a blockchain.
- A specific digital or physical asset can be linked to the NFTs.
- NFTs work in the same way as cryptographic tokens do.
- NFTs are not interchangeable, and they are not fungible.

Features of NFTs

Figure 1.2 describes the various features of NFTs:

Figure 1.2: *Features of NFTs*

The features of NFTs are as follows:

- **Unique:** Each NFT has a distinct attribute, personality, which means no two NFTs are alike.
- **Digitally scarce resource:** On a blockchain network, the NFT is kept, and the certificate of ownership is available to prove the identity.
- **Indivisible:** NFTs cannot be broken into smaller denominations, and you cannot buy or transfer a portion of it.
- **Ownership:** The ownership of the asset which is transmitted is guaranteed by the tokens.
- **Fraud proof:** Tokens can be easily transferred and unaffected by fraud.

Types of NFTs

Non-fungible tokens, or NFTs, are the newest digital assets that have taken

the world by storm. NFTs are non-transferable data units that are stored on the blockchain. The digital ledger issues a proof of ownership certificate to the NFT's owner. *Figure 1.3* describes the types of NFTs:

Figure 1.3: *Type of NFTs*

There are several types of NFTs, which are as follows:

- Artwork
    - Illustrations, pictures, or any other non-textual content created for publishing constitute artwork.
    - The most well-liked and significant group of NFTs is artwork.
    - When you save artwork, the digital ledger where the artwork is kept will give a public certificate of ownership and authenticity to you.

Note:

The sale of Beeple's digital artwork as NFTs (Non-Fungible Tokens) for a record-breaking $69 million is a great example of how NFTs are being used in the real world. Beeple's artwork was sold as unique and indivisible NFTs, each with its distinct value, representing ownership of a specific piece of digital art.

This sale shows the potential of NFTs as a new asset class and how they can be used to monetize and trade digital assets, such as art, music, and collectibles. The use of blockchain technology in NFTs provides a secure and transparent way to track ownership and transfer of these digital assets, making it easier for artists and creators to monetize their work and for

collectors to own and trade unique pieces.

The Beeple NFT sale is just one example of how NFTs are being used in the real world, and there are many other similar sales and projects happening in the NFT space.

- Collectibles
    - Digital assets like photos, music, and video snippets are examples of collectibles, which were the first NFTs to be released.
    - Despite being in digital form, they are identical to physical collectibles.

Note: Before Art You Cannot (BAYC) and CryptoPunks are examples of popular NFT projects in the real world.

BAYC is a new NFT project that allows users to own and trade unique pieces of digital art created by well-known artists. The project uses blockchain technology to track the ownership and authenticity of each piece of art, thus ensuring that the art can be easily traded and collected just like physical artwork.

CryptoPunks, on the other hand, is a collection of 10,000 unique 8-bit characters, each with its distinct personality and attributes. The project has become incredibly popular and has attracted a large following of collectors and investors who trade and collect these unique NFTs.

Both BAYC and CryptoPunks are examples of how NFTs are being used in the real world to create new and innovative digital assets that can be collected and traded just like physical assets. These projects demonstrate the potential for NFTs to transform the art and collectibles world, and how blockchain technology is being used to bring new opportunities to artists, collectors, and investors.

- Sports Memorabilia
    - A video clip of notable sports moments is included in the category of sports memorabilia.
    - The market is quite valuable and actively traded in physical form.
    - It consists of signatures, photos, prizes, and honors.

- Video-Game Assets

Players can participate in earning incentives like bitcoin, digital assets, or other NFTs in video games based on NFTs.

- Virtual Land
    - It is used to display adverts inside video games.
    - It contains real estate both in the Metaverse and in video games.

      Note: Decentraland is a good example to understand the concept of NFTs and how they are being used in the real world.

      Decentraland is a virtual world where users can buy, sell, and build on virtual land that is represented as NFTs (Non-Fungible Tokens). Each piece of land in Decentraland is a unique and indivisible NFT that can be owned and traded by its owner.

      In Decentraland, users can use their virtual land to create and explore digital experiences, such as games, social spaces, and virtual shops. The virtual world is powered by blockchain technology, which provides a secure and transparent way to track the ownership and transfer of virtual land, and enables users to own their creations and experiences in a decentralized and open-source platform.

      Decentraland is a great example of how NFTs are being used to create new digital assets and experiences, and how blockchain technology is being used to empower users and bring new opportunities to the virtual world.

- Memes

  Memes are also rising in value, with popular memes like Disaster Girl and Bad Luck Brian commanding high prices, making meme creators wealthy, and the meme market lucrative.

- Domain names

  Domain names are the cryptographic domains that are created on a blockchain and are independent of any centralized authority. Example: unstoppabledomains.com

- Music
    - This is a very novel aspect of NFT mania.
    - In this, artists pre-release their albums on NFT marketplaces before releasing them on traditional streaming platforms.
    - Buyers can purchase a share of the album, and when the album is released conventionally, the buyers will receive a portion of the album's profits.
    - Although the business model for these transactions has not yet been developed in Musical NFTs, many of them do.

Note: Snoop Dogg is one example of how NFTs and the metaverse are providing new and innovative opportunities for artists and musicians.

Snoop Dogg recently entered the NFT space and created a series of digital collectibles, including music, art, and virtual experiences, that were sold as NFTs (Non-Fungible Tokens). The NFTs were sold for millions of dollars, providing a new source of income for the artist and demonstrating the potential of NFTs to monetize digital assets.

The metaverse, or virtual world, is also providing new opportunities for artists and musicians to engage with their fans and create new experiences that were previously not possible in the physical world. For example, virtual concerts, art installations, and interactive experiences can be created in the metaverse, providing new ways for artists and musicians to earn money and reach new audiences.

The success of Snoop Dogg and other artists in the NFT and metaverse space is a sign of the growing potential for NFTs and the metaverse to transform the entertainment industry and provide new opportunities for artists and creators.

- Ticketing
    - Nowadays, event tickets may be created on blockchain platforms and then put up for auction by the organizers.
    - Additionally, the tickets can be kept and resold as collectibles.
- Real-world assets

    - NFTs have uses related to real-world assets.
    - A Real-World Asset NFT (rwANFt) token signifies virtual ownership of a physical object.
    - It adds an extra degree of protection because the tokens cannot be forged and the digital ledger allows transparency to deter fraud.
    - Tokens tied to rwANFTs form legal warranty, and insurance, and prove ownership.
- NFT Fashion

  It consists of outfits and accessories designed for video game characters and digital avatars.
- Identity
    - Due to non-fungibility characteristics, NFTs have begun to obtain identity in real-world traction. This feature also created a sense of certainty of transparency from the digital ledger.
    - It gives people an identification certificate.
- Miscellaneous Online Items

  It includes Blogs, Tweets, Posts on Instagram, or anything else created on a digital ledger and has non-fungibility.

Elements of NFTs

NFTs are everywhere, and every company is contemplating designing, marketing, and selling their own NFTs. NFTs are important because various factors contribute to their worth and their essential components are as follows:

- Scarcity
    - The initial component of NFTs, which is based on blockchain technology, is what gives them their value.
    - Blockchain ensures that an NFT is one-of-a-kind, cannot be duplicated, and is hence scarce.
    - A distinguishing feature of NFTs is that individual items cannot simply be replicated.

- As an illustration, in NFTs you are not allowed to screenshot the image since doing so may be consider as taking a picture of the dress or other items of clothing you are trying on. Recognize the situation; by taking that photo, you did not diminish the worth of the original product; rather, you increased its value by taking a picture of the original since you went to the bother of creating a replica of it (copyright issues).

- Meaning
  - Despite the fact that NFTs are rare, thousands of them are issued at once, badly affecting each NFT's particular meaning. If an NFT has no meaning, nobody cares about it, and it has no value. This is due to the fact that there are countless different NFTs that are comparable and might diminish the significance of a single item.
  - They should be able to give it even more depth over time and by the behaviors of NFT owners.
  - Take a look at an illustration of an NFT project where users may continually add meaning and value to their NFTs.

Figure 1.4 **describes the elements of NFTs:**

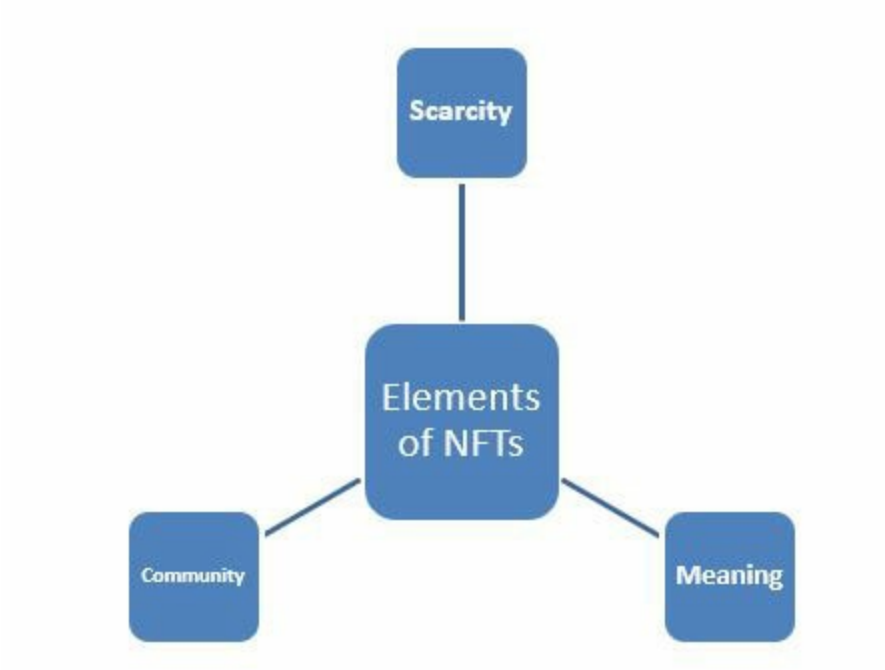

Figure 1.4: *Elements of NFTs*

- Community
    - This element of NFTs is essential for creating and maintaining NFTs.
    - The more people rally around the NFTs platform, there will be more demand, and thus the more scarcity value is created.
    - If a community has shared memories in the form of common history, myths, and other belief systems, it becomes more deeply rooted. By doing this, its digital worth will be increased since it will be possible to create a communal identity and shared experiences.

How a community is built and how community-building platforms like discord servers and social media platforms like Facebook, Twitter, and so on are useful in building and maintaining the community

Community building is the process of creating a group of people who share common interests and goals, and who come together to support each other and achieve those goals. Community building is important because it helps to create a sense of belonging, fosters collaboration and teamwork, and can help individuals achieve their goals.

Community-building platforms, such as Discord servers and social media platforms like Facebook and Twitter, are useful in building and maintaining a community because they provide a centralized place for people to connect, share information, and collaborate.

Discord servers are online communities where users can join channels to discuss topics, share information, and collaborate on projects. Discord servers can be used to build communities around specific topics, such as gaming, coding, or art.

Social media platforms like Facebook and Twitter are also useful for building and maintaining a community. These platforms allow users to connect with others who share similar interests and follow topics and people that they care about. They also provide a way to share information, such as news and updates, and to connect with others who are interested in the same things.

Building a strong and engaged community is important for the success of any project, and community-building platforms provide a way for people to connect, collaborate, and support each other. These platforms can be used to

build and maintain communities around any topic or interest, and provide a way for individuals to achieve their goals and build relationships with others who share their passions.

Uses of NFTs

A new technology called Non-Fungible Tokens (NFT) is extensively employed in applications like trading pieces of art and video game characters.

Physical items and digital content both can be represented using NFTs. Figure 1.5 describes the uses of NFTs:

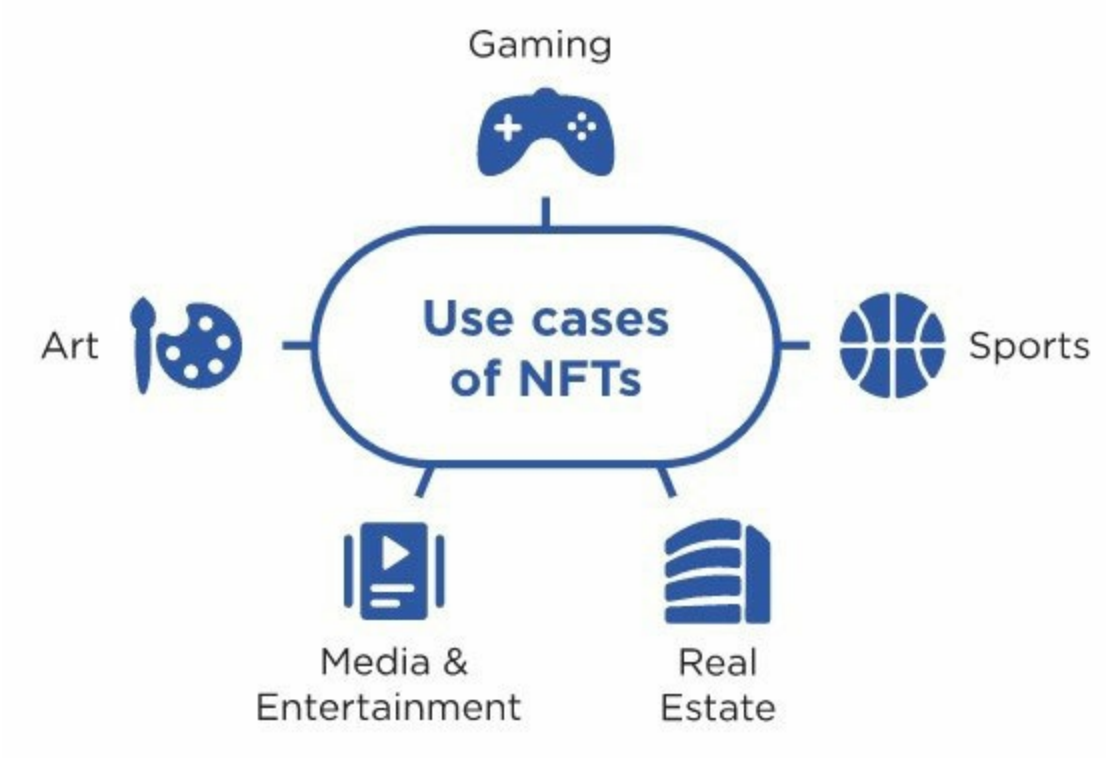

Figure 1.5: *Uses of NFTs*

NFTs are used in the following:

- Ensuring authenticity of products

  NFTs are used to verify the authenticity of the product you are buying. As you are aware, the blockchain can store product information forever, allowing you to verify the product's uniqueness and legitimacy. In order to ensure that everything is fair trade, NFTs may be used to record data on the manufacturing process.

NFT can be applied to the prototyping of consumer goods or commercial designs. By tracking and tracing food goods, NFTs have addressed the issue of fake food products, such as supplements and medicines.

- Real estate

  Timestamped NFTs can be used in real estate to track changes in property value over time, transfer land deeds, offer evidence of ownership, expedite transaction processing, and develop decentralized house rental services.

  Therefore, by adopting NFTs, you will be able to learn everything about the property you are buying with just a single tap on your phone, including when it was created, who owned it initially, and what alterations were made.

- Identification and verification and medical records

  Medical records of a person are kept on NFT ledgers without compromising their confidentiality or risk of being altered by other parties. Every record is accurate and safe from any fraudulent efforts since NFT transactions are confirmed on many nodes before being permanently committed to the blockchain.

  The fastest approach to establishing a lifetime identity on the blockchain today is to issue infants with NFT birth certificates, which connect their birth certificates after being confirmed with NFT verification applications.

- Intellectual Property and Patents

  Patents and intellectual property can be protected with NFTs. Users can demonstrate their ownership of any piece of content using NFT tokens.

  An IP, which can be identified by its timestamps and whole history, can be used to demonstrate ownership. To demonstrate that the owner is the original author of the work, the NFT chain is immutable.

- Academic background

  NFTs can offer evidence of attendance, a degree earned, and other significant academic data about the individual. This data is saved on the NFT chain and cannot be changed or compromised. By distributing tokens for each course with the proof of its completion and degrees

achieved through smart contract verification mechanisms, NFTs are utilized to generate immutable records for courses.

NFT education tokens can be transferred to other people as evidence that the person holding it has earned it in the future when they are used to track academic success.

- Supply Chain

  Verifying or knowing where a product originated from or what is in it is a big concern in the food industry. However, NFTs may be tied to a product via the blockchain, giving it a non-tamper-proof NFT identity. In the supply chain, this is an illustration of NFTs.

  NFTs allow businesses to track their products from manufacture to delivery. This maintains supply chain openness and provides customers with information about the business.

- The gaming sectors

  NFT cross-platform playability enables the integration of NFTs into the gaming industry. NFTs provide game creators with the opportunity to grow their brand and add a new source of income. In this scenario, owning characters or other in-game things provides players with an incentive to play.

  As there is no middleman involved and all transactions occur quickly over the blockchain, NFTs also make trading in games simpler. Owners won't have to worry about scams with NFTs.

- Ticketing

  In the very near future, NFTs will take the place of tickets. NFT tickets, which assign a specific ID for validation reasons, might, for instance, replace parking cards.

  Because NFT owners would only require one token rather than several copies of it, this eliminates the problems with fraud and lowers paper use.

- Artwork tracking

  After World War II, a lot of artwork was stolen, replaced by fakes, and lost. Old masters' original works of art can be tracked by employing NFTs. It can assist in tracing a piece's origins and ensuring NFT owners that their property is authentic.

- Voting

  You must have a picture ID and proof of residency with you when you go to the polls to cast your vote. But occasionally, a lot of individuals forget to have their identification with them or any kind of paperwork that would show where they reside or if they are even registered to vote.

  Imagine if NFTs could be included in the voting process. Your issues are all resolved since NFTs will provide official documents proving their identity and place of residence a digital identity.

  As NFTs will be an official record of people who voted and their votes, this will also eradicate fraud and cheating in the voting process.

Working of NFTs

Blockchain, a distributed public ledger used to record transactions, is where NFTs are kept. NFTs are kept on the Ethereum blockchain. Digital objects that represent both tangible and intangible objects make up an NFT, and they are as follows:

- Collectibles
- GIFs
- Videos and sports highlights
- Online avatars
- Designer sneakers
- Music
- Tweets

In NFTs, the buyer gets a digital file and exclusive ownership rights instead of physical objects.

Let us understand its working:

- The unique identity and ownership of an NFT is verifiable via the blockchain ledger.
- The NFTs identify its ownership, and it can be bought and sold as any other type of art – and, like with physical art.
- C**onsider an example to understand the concept in a better way**: If you go into a gift shop or an art gallery, you will find a number of

replicated copies of famous masterpieces, and you will be surprised to know that NFTs also act the same way.

- NFTs are parts of the blockchain that are totally valid but do not hold the same value as the original.
- NFTs come with a license to the digital asset it points to but does not automatically confer copyright ownership.
- Here, the copyright owner may reproduce work, and the NFT owner gains no royalties.

NFTs ownership rights

NFTs can only have one owner at any given time. Its unique data makes it straightforward to transfer tokens between owners and to confirm ownership. The owner or author may also utilize NFTs to store certain information.

Trading of NFTs

Similar to cryptocurrencies, NFTs are also bought and sold on specialized platforms. Here, the sale involves the transfer of the object depicted by the token or the changes of ownership of the NFT, which is registered on the blockchain.

Note: While working with NFTs, you need to keep the certificate safe in a digital wallet. The digital wallet can be accessed via Metamask (a free internet browser extension or a secure physical device). To purchase an NFT, the wallet must contain relevant cryptocurrency.

MetaMask is a browser extension and mobile wallet that allows users to store and manage their Ethereum-based assets, such as cryptocurrencies and NFTs (Non-Fungible Tokens). When creating a MetaMask account, users are given a unique seed phrase, which is a 12-word phrase that serves as the backup and recovery mechanism for the account.

The 12-word seed phrase is used to generate the private keys for the MetaMask account, and it is important that the seed phrase is kept safe and secure. When importing a seed phrase into MetaMask, the user is prompted to enter the 12 words in the correct order, and once the seed phrase is imported, the user can access their assets and transactions.

If the seed phrase is forgotten or lost, it cannot be recovered, and the assets in the account will be lost. This is why it is important to store the seed phrase in a secure and accessible location, such as a secure digital or physical storage device.

It is also important to never share the seed phrase with anyone, as it gives access to the assets in the MetaMask account. If someone has access to the seed phrase, they have access to the assets, so it is important to keep the seed phrase secure and protected.

Planning to buy NFTs

Since NFTs have become more popular due to the pandemic, many investors are unsure of how to purchase them. As the value of cryptocurrencies and other digital assets has increased dramatically, artists, collectors, and speculators have all become involved in the NFT movement. NFTs show promise for artists and have applications in the corporate world, therefore it appears to be the beginning of a new long-term investment asset class.

Buying, creating, and selling NFTs

As you are already aware, NFTs, or "Non-Fungible Tokens," are used to ensure the ownership of unique (digital) assets like works of art, musical compositions, and so on.

On a blockchain, these tokens are created and maintained. The same digital ledger technological platform is used by Bitcoin and other cryptocurrencies. NFTs are often built on the Ethereum network, however, there are other blockchains like Solana and Polkadot that employ certain NFTs as well.

These digital tokens may be compared to virtual certificates that you give to establish that you are the rightful owner of a physical certificate. NFTs, or non-transferable tokens, are digital proofs of ownership that were first created for digital assets and works of art. They are now used to ensure the ownership of distinctive physical assets, including as real estate, collectibles, and physical works of art.

Buying NFTs

A process known as a dedicated NFT marketplace is used to buy and sell

NFTs. Similar to Amazon or Etsy, the NFTs marketplace allows you to purchase and sell solely digital products. Similar to the exchange system for buying and selling cryptocurrencies and equities, these markets are utilized to buy an NFT at a predetermined price in a virtual auction.

Prices for NFTs that are being sold via auction are unstable, which means that they vary sometimes and are influenced by demand. Prices rise in direct proportion to demand.

Let's examine the main distinction between NFTs and stocks and cryptocurrencies, namely the fungibility of the latter two. If a share of Amazon is fungible, it indicates that it is identical to another share of Amazon. Because NFTs are non-fungible, the token you purchase symbolizes a special good that cannot be easily replaced.

You must create and fund a crypto wallet on an NFT exchange in order to put a bid on digital assets. The digital wallet used to hold the coins required to buy an NFT is called a cryptocurrency wallet. You will learn more about OpenSea, Rarible, SuperRare, and Foundation, four different marketplaces that accept NFT purchases, in the following chapters.

You must open and fund the appropriate crypto wallet to invest in NFTs. After that, you can make a bid on the NFT of your choice.

Creating NFTs

Anyone who can guarantee the validity of their work and monetize it, including creators, artists, singers, filmmakers, and authors, is able to develop NFTs. Anybody may mint a digital asset and sell it as an NFT on a marketplace.

The fundamental minting procedure is identical across all platforms, and it is as follows:

- Open a cryptocurrency wallet and add coins to it.
- In the marketplace, select the "Create" button, then upload your project.
- Place the NFT up for auction or for sale at a defined price.

Selling NFTs

Once you have acquired an NFT, the digital asset belongs to you. You may

utilize it to create a larger digital project, retain it as a collectable to show others, or advertise it for sale.

When selling NFTs, marketplaces charge a gas fee. As blockchain computing is required to verify how much energy the NFT consumes, or what is known as a "gas cost," the fees vary depending on the blockchain network that the NFT employs.

To sell a digital asset you own, perform the following steps:

- The digital asset must be uploaded to your marketplace, which accepts the blockchain that the NFT was constructed on.
- Decide whether to put it up for auction with bids from potential purchasers or advertise it for sale at a fixed price.
- The marketplace will check the asset when it has been posted.
- The marketplace will handle the transfer of the NFT from the seller to the buyer when the item has been sold.
- After subtracting the listing charge and other relevant blockchain processing costs, the marketplace will transmit the cryptocurrency cash to your wallet.

Pros and Cons of NFTs

Let us understand the pros and cons of NFTs.

The pros of NFTs are as follows:

- Unlike digital art, which also shows price appreciation, physical artifacts like art have a long history of rising in value.
- Purchasing and selling digital assets as more buyers and sellers get access thanks to NFTs.
- It makes sure that authors and artists get compensated based on how their work is used and sold in the future.

The cons of NFTs are as follows:

- NFTs refer to investing in static assets that don't provide any revenue and are largely evaluated using arbitrary criteria like consumer demand.
- Sky-high prices might not persist indefinitely, and NFTs might lose a lot of value.

- It costs money to create and sell NFTs, and the fees may exceed the value of the NFT.
- By consuming a considerable amount of energy to produce and validate transactions, NFTs and blockchain technology have an adverse effect on the environment.

Note: Gas fee in Ethereum to be high, especially during periods of high demand on the network. The gas fee is determined by market forces, and it is directly proportional to the demand for processing transactions on the Ethereum network. When there is a high demand for processing transactions, the gas fee tends to increase, as miners are incentivized to prioritize transactions with higher gas fees.

There have been instances in the past where the gas fee has surged to high levels, such as during the DeFi boom in the summer of 2020, where the gas fee reached levels as high as $20 or more. In such cases, the high gas fee can make it more expensive to process transactions on the Ethereum network, including NFT transactions.

It's worth noting that while high gas fees can be a concern for some users, they also indicate a high demand for using the Ethereum network, which can be seen as a positive sign for the overall adoption and growth of the Ethereum ecosystem.

In summary, gas fees in Ethereum can be high during periods of high demand on the network, and there have been instances in the past where the gas fee has reached levels as high as $1000 or more. However, the gas fee is determined by market forces, and it is a key component of the cost of using the Ethereum network for NFT transactions and other blockchain-based activities.

Ideal investment as NFTs

The NFT movement is new and gives more people jobs in the digital economy. For artists, producing and selling digital goods makes a lot of sense, but purchasing NFTs as collectibles turns them into risky investments. Depending on the demand, its value becomes erratic and fluctuates.

There is no set of rules or set of criteria to determine whether collectibles' values will rise or fall and which ones won't. However, doing your research

on the new NFT trend early might be quite beneficial.

As a result, experimenting with NFT investment makes sense for you if you appreciate collecting art and music. When purchasing a digital asset, it is important to understand who created it, how unique it is, who had it previously, and whether or not it can be utilized to make money.

However, you must realize that NFTs are like a "bubble" that is about to burst before investing in them. However, it does not alter the reality that digital assets will eventually need to cool off as well. Therefore, consider the risks before investing and diversify your portfolio.

Keep in mind that NFTs are still in the developmental stages. It is a fresh and exciting technological front that nevertheless carries some danger.

Technical aspects of NFTs

NFTs are digital assets that represent ownership or proof of authenticity of a unique item or piece of content, such as art, music, video, collectibles, or virtual real estate. NFTs are built on blockchain technology and use cryptographic techniques to ensure their uniqueness and authenticity.

The technical aspects of NFTs include the following:

- **Blockchain Technology:** NFTs are built on blockchain technology, which provides a decentralized, secure, and transparent ledger of all NFT transactions. This ensures that NFTs cannot be duplicated, altered, or lost and that ownership and provenance of NFTs can be tracked and verified.
- **Token Standard:** NFTs are created using token standards such as ERC-721 or ERC-1155, which define the properties and behaviors of NFTs on the Ethereum blockchain. These token standards specify the rules for minting, transferring, and storing NFTs, and ensure that NFTs are compatible with different applications and platforms.
- **Cryptography:** NFTs use cryptographic techniques to ensure their uniqueness and authenticity. For example, NFTs are assigned a unique identifier or hash, that is stored on the blockchain, which serves as a digital fingerprint that cannot be duplicated or altered.
- **Digital Wallets:** NFTs are stored in digital wallets, which are secure digital storage systems that allow users to manage and transfer their

NFTs. Digital wallets are used to hold the private keys that are required to access and transfer NFTs, and they are protected by a password or seed phrase.

- **Interoperability**: NFTs are designed to be interoperable across different applications and platforms, which allows them to be easily traded, collected, and used in different contexts.

Start your journey with NFTs

NFTs, also known as non-fungible tokens, are becoming more and more popular, and buyers are willing to pay high prices for these rare collector cryptocurrency assets.

Let us start our journey by understanding the steps to make (mint) and sell an NFT:

- Select the unique digital asset you want to turn into an NFT.
- Once you have selected the unique digital asset, start the process of minting it into an NFT.
- Set up a digital wallet to access your digital assets.
- Select an NFT marketplace.
- Connect your marketplace to the digital wallet.
- Upload your file.
- Set up the sales process.
- The final stage in the NFT minting process is to decide how you want to monetize your NFT. You can either:
    - Sell it at a fixed price.
    - Set a timed auction.
    - Start an unlimited auction.
- You need to determine the minimum price, royalties to continue cashing in on your NFT if it resells on the secondary market, and how long to hold an auction.
- Keep fees in mind when setting the minimum price because you could lose money on your NFT sale if you set the price too low.

Note:

- **The fees to mint and sell an NFT can be costly and confusing.**
- **Based on platform and pricing, you need to pay a listing fee, an NFT minting fee, a commission on the sale, and a transaction fee to transfer money from the buyer's wallet to yours.**

Minting and selling NFTs can come with fees that can be costly and confusing, especially for new users. These fees are usually related to the cost of processing transactions on the blockchain network, and they can vary depending on the network and the token standard used for the NFT. The minting and selling fees are:

- **Minting Fees**: Minting an NFT usually requires paying a fee to the blockchain network to cover the cost of processing the transaction. This fee is called the gas fee, and it is paid in the native cryptocurrency of the blockchain network, such as Ether (ETH) in the case of the Ethereum network. The gas fee is determined by market forces, and it can fluctuate based on the demand for processing transactions on the network.
- **Selling Fees**: When selling an NFT, the seller may also incur fees, such as a transaction fee for processing the transfer of the NFT from the seller's wallet to the buyer's wallet, or a platform fee for using a specific marketplace or platform to sell the NFT.

In addition to these fees, NFT sellers may also have to pay for marketing and promotion expenses, as well as for storing and maintaining the NFTs in their digital wallets.

Overall, the cost of minting and selling NFTs can be confusing and substantial, especially for new users who may not be familiar with the costs associated with using blockchain networks and token standards. It's important to research and understand the fees associated with NFT transactions before engaging in NFT trading or sales.

Conclusion

In this chapter, we explained that NFTs is the digital asset which depicts real-

world elements like art, in-game items, video, and music. NFTs, like Bitcoin, provide ownership data that may be used to identify and transfer ownership between token holders. In NFTs, owners can add information or attributes related to the asset.

Then, we discussed the characteristics, features, and types of NFTs such as Artwork, Collectibles, Sports Memorabilia, and Video-Game Assets.

In the end, we discussed the uses, how NFTs work, ownership rights, and how NFTs are traded.

In the next chapter, we will learn about Tokens, their importance, significance, token standards, and fungible/non-fungible terms.

Key terms

- **NFTs:** Digital assets which depict real-world elements like art, in-game items, video, and music.
- **Artwork:** Illustrations, pictures, or any other non-textual content created for publishing constitute artwork.
- **Collectibles:** Digital assets like photos, music, and video snippets are examples of collectibles, which were the first NFTs to be released.

Multiple Choice Questions

1. **NFTs data units can be associated with:**
    a. Photos
    b. Videos
    c. Audio
    d. All of the above
2. **Which of the following is a characteristic of NFTs?**
    a. Unique
    b. Divisible
    c. Unidentifiable
    d. Tokens cannot be transferable

3. **The essential components of NFTs are:**
    a. Scarcity
    b. Meaning
    c. Community
    d. All of the above
4. **_____ are the cryptographic domains that are created on a blockchain and are independent of any centralized authority.**
    a. Domain names
    b. Music
    c. Ticketing
    d. Real-World Assets
5. **NFTs are used in:**
    a. Ensuring Authenticity of Products
    b. Real Estate
    c. Identification verification and medical records
    d. All of the above

Answers

1. d
2. a
3. d
4. a
5. d

Join our book's Discord space

Join the book's Discord Workspace for Latest updates, Offers, Tech happenings around the world, New Release and Sessions with the Authors:

https://discord.bpbonline.com

CHAPTER 2

Understanding Tokens, Fungible and Non-Fungible

In the previous chapter, we studied **Non-fungible tokens** (**NFTs**), a non-interchangeable unit of data stored on a blockchain. NFT data units can be associated with digital files, including photos, videos, and audio.

In this chapter, we will study tokens. Technically, "Token" is another word for "cryptocurrency" or "crypto asset." However, increasingly, it has taken on a couple of more specific meanings depending on the context. It describes certain digital assets that run on top of other cryptocurrencies' blockchains, as many decentralized finance tokens do. Tokens help decentralized applications to do everything from automating interest rates to selling virtual real estate. Tokens can also be held or traded like any other cryptocurrency.

So, let us begin our journey and start exploring more about tokens.

Structure

In this chapter, we will cover the following topics:

- Introduction to tokens
- Importance of tokens in the financial business
- Significance of tokens
- Understanding the terms fungible, non-fungibility
- Token standards
- Token standards for Tezos
- Ethereum tokens

Objectives

After studying this chapter, you should be able to understand tokens and their

importance, and know the difference between token, fungible, and non-fungibility. You will also learn about token standards, Ethereum, and Tezos tokens.

Introduction to tokens

Tokens are virtual currencies representing fungible and tradeable assets or utilities on their blockchains. The digital representation of your investment interest in single crypto or non-crypto asset or basket of crypto or non-crypto assets underlying the token, which is coined and issued by a **Crypto Asset Provider** by its rules, in the form of a crypto asset token.

Tokens are often generated, issued, sold, and circulated through the standard **Initial Coin Offering (ICO)** process, which entails a crowdfunding exercise to raise funds for project development.

So, the token is an object which represents another object (either physical or virtual) or an abstract concept. For example, a gift is sometimes referred to as a token of the giver's esteem for the recipient.

A digital token is a piece of cryptographic data used to make a real-world transaction easier. It could be anything from an online money transfer to a service subscription. *Figure 2.1* shows the NFTs token:

Figure 2.1: *Digital Token*

Digital tokens are available on the blockchains Bitcoin and Ethereum. Bitcoin may be used as "Digital Money," whereas Ethereum's ETH token has a variety of development applications.

Digital tokens, for example, are analogous to the chips used in a poker game or the Arcade tickets used to redeem incentives. They have not regulated currencies, but they do have a particular worth.

Definition of token

Tokens are:

- Cryptocurrencies which represent a specific asset and are stored on their blockchain.
- Used to invest in, store value, or make purchases.
- Digital currencies that are used to facilitate blockchain transactions (making and receiving payments).

Working of Crypto tokens

Crypto tokens are cryptocurrency assets denominated in virtual currencies and exist on their blockchains. Blockchains are digital ledgers that store data in blocks linked or chained together. As a result, crypto tokens, also known as **crypto-assets**, represent a specific unit of value.

Detailed working of Crypto tokens

You can follow these measures to understand the working of Crypto tokens:

- To safeguard the token, encryption methods and cryptographic techniques such as elliptical curve encryption, public-private key pairs, and hashing functions are used.
- Cryptocurrencies are online payment platforms that make secure payments by using virtual tokens. The internal ledger entries of the system represent these tokens.
- These digital assets are commonly used as transaction units on blockchains, which are built by using standard templates, such as those supplied by the Ethereum network, allowing users to create tokens.

- Smart contracts, or decentralized applications, are based on smart contracts, in which programmable, self-executing code is utilized to handle and manage the blockchain's various transactions.

Tokens are frequently generated by dongles or key fobs that create a new authentication token every 60 seconds according to a predetermined algorithm. Because of the power these hardware devices possess, users must keep them secure to prevent falling into the wrong hands. As a result, when a team member's work expires, they must return their dongle or fob.

Structure of token

The most typical token systems include a header, payload, and signature. The payload type and the signature algorithm are both included in the header. The claims, which are any comments about the user, are contained in the payload. The signature does exactly what it says: it is used to show that the communication was not tampered with while en route. These three components (header, payload, and signature) work together to build an authentication system that is both efficient and safe.

While classic token authentication methods remain in use today, the rise of smartphones has made token-based authentication more accessible than ever before. Smartphones can now be enhanced to serve as code generators, giving end-users the security passcodes, they need to access their network at any time. Users receive a cryptographically secure one-time passcode as a part of the login procedure, having a time limit of 30 or 60 seconds, depending on the server settings. These soft tokens are produced on the device by an authenticator software or supplied through SMS on demand.

Because of the widespread adoption of smartphone token-based authentication, most employees already have the devices necessary to produce the codes. As a result, deployment costs and employee training are kept low, making token-based authentication viable for many businesses.

Examples of Crypto assets

The following are some examples of crypto assets with the word "token" in their name:

- **Defi Tokens:** They are a type of token that evolved in recent years into

a new universe of cryptocurrency-based protocols to replicate traditional financial-system operations (lending and saving, insurance, and trading). These protocols provide tokens that can be used for a number of purposes while also being exchanged and held like any other cryptocurrency.

- **Governance Tokens:** These are specialized DeFi tokens that provide holders with a say in the future of a protocol or program that does not have boards of directors or any other central authority (due to its decentralized nature). The popular savings protocol Compound, for example, issues a token called **COMP** to all users. This token's owners have a vote in how the Compound evolves. If you have more COMP tokens, you will receive more votes.
- The **Decentralized Autonomous Organization** (**DAO**) is a type of organization that operates through smart contracts on a blockchain network. It allows for decentralized decision-making and management without the need for intermediaries.

  Governance tokens play a crucial role in DAOs, as they represent the ownership and decision-making power of the members within the organization. Holders of governance tokens can participate in voting on proposals and make decisions that affect the direction and operation of the DAO.

  In some DAOs, the voting process involves burning tokens, which means that the tokens are permanently removed from circulation. This process is used to increase the scarcity of the tokens, which can have a positive impact on the value of the remaining tokens. By burning tokens, members are effectively demonstrating their commitment to the success of the DAO, as they are sacrificing a portion of their ownership for the greater good of the organization.

  In this sense, the burning of tokens can serve as a way to increase the weight of individual votes, as members who have burned a significant amount of tokens will have a greater say in the decision-making process. However, it is important to note that the specifics of the voting process and the role of governance tokens can vary greatly between different DAOs.
- **Non-fungible Tokens (NFTs): Non-fungible Tokens** (**NFTs**) provide ownership rights to a single digital or physical asset. They can be used

to make it more difficult to copy and share digital products. They have also been used to distribute a limited quantity of digital artworks or sell one-of-a-kind virtual assets, such as unique gaming items.

NFTs are typically issued as unique digital tokens used on the Ethereum blockchain.

- **Security tokens:** Security tokens are a new asset type, the crypto equivalent of traditional securities like equities and bonds. Their principal use is to sell shares in a corporation (similar to shares or fractional shares sold on traditional exchanges) or other enterprises (such as real estate) without a broker. Major organizations and startups are looking into security tokens as a viable replacement for traditional financing methods. Security Tokens are used to deliver securities to investors, ranging from corporate stock to dividends to assets. These tokens are subject to regulatory scrutiny because they can be considered property.
- **The catch:** Typically, startups do not sell securities such as stocks or shares in an ICO, but if you believe this is the case, double check the security you are receiving.
- **Utility Tokens:** Tokens that a corporation sells to customers who want to buy its services or products. These coins are not subject to government regulation and can only be used within the company's ecosystem. Although these tokens can be used to purchase the firm's products and services, they do not imply ownership of the company. It is similar to buying credits for a software program and then burning them when the software is used.

  In February 2021, Elon Musk, CEO of Tesla, made a tweet suggesting that Tesla would accept Bitcoin as payment for its cars. This announcement created significant excitement in the cryptocurrency community and was seen as a major endorsement of Bitcoin by a major corporation.

  However, in May 2021, Tesla reversed its position and announced that it would no longer accept Bitcoin as payment, citing concerns over the environmental impact of Bitcoin mining. Despite this reversal, the episode demonstrates the potential for cryptocurrencies like Bitcoin to be adopted by corporations for real-world transactions.

In this case, Elon Musk's offer to accept Bitcoin for Tesla cars created a strong connection between the cryptocurrency and a well-known brand, showcasing the potential for cryptocurrencies to be used for real-world transactions and highlighting the increasing mainstream acceptance of cryptocurrencies.

Translation of digital tokens into real money

When it comes to security tokens, tokens are treated as properties which means you are buying a sellable asset. The same dynamics of a stock trade operate with security tokens — their value rises and falls as more people participate in the economy.

Utility tokens are priced by the company and are independent of any economic impact. They do not represent any real-world asset or property outside the company's ecosystem. You simply purchase them to use the services of the company.

Podminers POMT token is also a utility token designed to facilitate internal transactions. You can purchase the token to use the services offered by the Podminers platform**.**

El Salvador is the first country to officially adopt Bitcoin as a legal tender. In June 2021, the country's legislative assembly passed a law that recognizes Bitcoin as a form of legal currency, alongside the US dollar, which has been used as the official currency in El Salvador since 2001.

The adoption of Bitcoin as a legal tender in El Salvador was seen as a significant step towards the mainstream acceptance of cryptocurrencies and has sparked discussions about the potential for other countries to follow suit.

However, it is worth noting that the adoption of Bitcoin as a legal tender in El Salvador is not without challenges, such as the limited infrastructure for using and exchanging Bitcoin, as well as concerns about its volatility and potential for illicit use. Despite these challenges, the move by El Salvador is being closely watched by the financial and cryptocurrency communities as an indicator of the growing mainstream acceptance of cryptocurrencies.

Importance of tokens in the financial business

An asset is tokenized or fragmented and generates many individual value

shares known as tokens. The tokens represent the value of an acquired share in a corporation or physical property. **Non-fungible token** (**NFT**) is an original and one-of-a-kind cryptographic token. It is "non-substitutable" in comparison to fungible tokens like bitcoin. The token is unique and cannot be duplicated.

Consider an example: If you buy 0.5 percent of an expensive bottle of wine in tokens, you own precisely 0.5 percent of the wine. Alternatively, if you purchased a house using tokens, you get a share of the rental income. Tokens have rights and obligations that are agreed upon in advance as part of a smart contract. The financial industry distinguishes between equity and asset tokens when it comes to tokenization.

A token should be viewed as a component of a larger whole. A token linked to blockchain technology secures specific assets, goods, or rights ownership.

Tokens: a potential threat

Cryptocurrencies like Bitcoin and Ethereum are posing fresh challenges to the economy. The issue with tokenization is similar: the general public, lawmakers, and authorities are wary of the new form of investing. According to Cyrus de la Rubia, chief economist at RBC Capital Markets, governments and businesses should not reject blockchain and tokens as fixed ideas or threats.

Use of equity tokens

An equity token is also known as a security token. It is a security-like token that functions similarly to stock. Equity token owners have the same rights and responsibilities as the company they invest in. The same is true for traditional securities.

Benefits of an equity token

The following are some of the benefits of equity tokens over traditional shares:

- Significant cost and time savings.
- Significantly fewer formalities, as banks, and other financial institutions are not involved in the process.

- Trading via the blockchain is feasible 24 hours a day.
- Right to have a say.

Purpose of asset tokens

Real property is tied to an asset token like real estate or a work of art. The asset token is comparable to securities since it reflects an existing counter value. As a trading platform, the blockchain is utilized. It effectively takes over the role of the stock exchange.

If the asset's value improves, you may be entitled to a share of the profits as the owner of asset tokens. However, be cautious: you must also accept the possibility of a fall in value.

Benefits of asset tokens

The following are some of the benefits of asset tokens:

- There are fewer barriers for you to participate in the financial market as an investor.
- Tokens can be denominated in extremely small amounts, allowing for unique investments.
- The market becomes more efficient. Everything that may be traded on exchanges is now available as an investment asset.

Significance of tokens

So, what is the purpose of a token? The answer to this is crucial to fully comprehend the fungible vs. non-fungible token argument. A token isn't limited to a single function and can be used for a variety of things in its original ecosystem. The following are examples of possible functions:

- Tokens can be used as entry points into blockchain applications, and users must have tokens to use the decentralized program.
- Tokens could potentially represent an individual's eligibility to possess specific voting rights. EOS blockchain coins, for example, can be used to vote on block makers.
- Tokens can also be useful entities for enhancing holders' user

experiences. Enhancement tokens for user experience can help to improve the user experience within the confines of a certain context. For example, in the case of the Brave web browser, users with BAT or other Brave-related tokens may be able to augment their customer experience by using their tokens to add adverts or other attention-based services related to the Brave platform.

- Most importantly, the use of tokens as currency aids in identifying fungible and non-fungible tokens. Tokens can be used as a store of value for internal and external transactions in a particular ecosystem, and they provide a unique monetary system that includes digital assets.
- Another important use of tokens is for value exchange. Tokens have typically been utilized for value exchange in the blockchain ecosystem. As a result, tokens may be useful in developing an application's internal economic system.
- It is also necessary to consider the use of tokens to identify who owns a specific organization. Tokens can indicate ownership of something unique to a single user, and this use lays the groundwork for the dispute over fungible vs. non-fungible tokens.

Understanding the term fungible and non-fungibility

The concept of tokens has not changed in the crypto era: they represent tangible (physical) or intangible (non-physical, that is, a service) within an ecosystem.

Fungible tokens in a blockchain are cryptocurrencies like **Bitcoin** (**BTC**). Nonfungible tokens are data units that represent a single digital asset that is confirmed and stored on the blockchain.

Fungible and nonfungible tokens

The main distinction is that crypto tokens use a code script to express their fungibility.

Tokens or assets that are fungible are divisible and non-unique. Fiat currencies, such as the dollar, are fungible; for example, A $1 bill in New York City and a $1 bill in Miami have the same value. A cryptocurrency, such as Bitcoin, can also be a fungible token: No matter where it is issued, 1

BTC is worth 1 BTC.

Nonfungible assets, on the other hand, are one-of-a-kind and cannot be divided. They should be viewed as a deed or ownership title for a one-of-a-kind, non-replicable item. An airline ticket, for example, is non-fungible because it contains unique data that cannot be duplicated.

Nonfungible tokens, like photographs or intellectual property, represent a single unique and indivisible entity – physical or intangible. Blockchain technology is the foundation for proving ownership of intangible digital property.

The content they store is the key difference between fungible and nonfungible assets. Nonfungible tokens, unlike fungible tokens like Bitcoin, store data such as an academic titles or artwork.

How tokens are different from cryptocurrencies

The underlying blockchain technology underpins both cryptocurrencies and crypto tokens. On the other hand, Cryptocurrencies are payment coins with their blockchains. Cryptocurrencies such as Bitcoin, **Ether** (**ETH**), and Litecoin are examples of blockchain-based cryptocurrencies. They are fungible crypto tokens that can be used to hold value or to buy and sell goods.

On the other hand, crypto tokens are created on a different blockchain. Tokens produced on Ethereum include Uniswap, Chainlink, and ERC-20.

Meaning of fungible and nonfungible tokens in blockchain

Tokens in a blockchain are commonly known as crypto tokens, and they represent digital units of value established on current blockchain networks. Businesses create tokens on the blockchain for various purposes, including transferring currency, granting subscription access, and even voting.

The first fungible tokens, ERC-20, were created on the Ethereum network. They establish the guidelines that enable developers to create a variety of applications.

ERC-20 tokens were the foundation of the initial coin offering era, which grew to a value of roughly $15 billion between 2016 and 2018.

Since 2012, when the concept of colored coins first appeared on the Bitcoin blockchain, nonfungible tokens have been around. Colored coins allow the attachment of metadata — additional information about the specific data used — to Bitcoin transactions rather than building other blockchains as sidechains.

Colored coins may reflect real-world assets sold on the Bitcoin blockchain; however, they must be founded on trust related to a contract outside the blockchain. A group must agree that a specific number of these coins have different worth. In that situation, they may be able to transact in that value using these "designated" coins.

The digital tokens utilized are Satoshis, small fractions of a Bitcoin that are identified or "colored in" with information that links them to real-world assets.

Colored coins haven't found much use in the cryptocurrency world. They were mainly used to make and trade artworks such as "Rare Pepe" digital cards on Counterparty, a peer-to-peer trading network based on Bitcoin's blockchain.

On the Ethereum blockchain, the first nonfungible tokens were created, which were used to identify a product, service, or person uniquely.

Some NFTs are based on the Tron and EOS blockchains, which are used to hold voting tokens. This form of the token can be used for a wide range of things, from collectibles like artwork and musical compositions to lottery tickets to a concert to athletic event tickets.

Because NFTs are easily traceable and verifiable, they can also be used as marketplaces for maintaining academic titles and digital identities on the blockchain.

After their remarkable market expansion in 2020 and 2021, there was a misperception about NFTs: they are only seen as artworks. However, long before the arts were involved, NFTs had a considerable application in the gaming business.

CryptoKitties first surfaced in 2017 on the Ethereum blockchain. The game was the first real-world use of NFTs in the crypto sector, and it went on to become the Ethereum protocol's most popular decentralized application.

NFTs are identified on the Ethereum blockchain using a separate standard from the ERC-20, the ERC-721.

ERC-1155 is a newer token standard on the Ethereum blockchain that allows for the creation of multi-functional tokens, including **Non-Fungible Tokens** (**NFTs**). ERC-1155 tokens can act as both fungible and non-fungible tokens, making it a versatile and flexible standard for token creation.

Unlike other token standards, such as ERC-721, which is specifically for non-fungible tokens, the ERC-1155 standard allows for the creation of both fungible and non-fungible tokens within the same smart contract, making it more cost-effective for developers and easier for users to manage their assets.

The versatility and flexibility of ERC-1155 make it a popular choice for developers looking to create NFTs, as well as for businesses looking to create tokens that have both fungible and non-fungible properties. With the growing popularity of NFTs, the use of ERC-1155 is likely to become increasingly common in the near future.

ERC-721 and ERC-1155 are both token standards on the Ethereum blockchain, but they have different properties and are used for different purposes in the NFT space.

ERC-721 is an NFT standard that was created specifically for creating unique, one-of-a-kind assets on the Ethereum blockchain. Each ERC-721 token represents a unique digital asset that can be bought, sold, and traded. Examples of NFTs created using the ERC-721 standard include collectible items, virtual real estate, and rare digital art.

On the other hand, ERC-1155 is a multi-functional token standard that allows the creation of both fungible and non-fungible tokens within the same smart contract. This standard allows greater flexibility and versatility compared to ERC-721, as it allows for the creation of different types of assets within the same smart contract. This can be more cost-effective and easier to manage compared to using separate contracts for each type of asset.

Foundation for comparing fungible and non-fungible tokens

Blockchain is the best technology for managing various forms of digital assets. Its immutability and security characteristics make it excellent for managing digital assets. It is hard to write any unique information to fungible tokens, which are often used in the blockchain until now.

On the other hand, Cryptographic tokens are one-of-a-kind and can store data rather than value, which is the best option. Non-fungible tokens are defined on the Ethereum platform using ERC standards like the ERC-721 standard. As a result, the distinction between fungible and non-fungible tokens derives from the emphasis on data storage.

Let us recap the definitions of fungible and non-fungible tokens to lay the groundwork for comparing them.

In economic terms, fungibility refers to an asset's or good's ability to be interchanged with another asset or good of equal value. Currency and money are the most common instances of fungible assets. For example, a $5 bill in one person's possession has the same value as a $5 bill in another person's possession. Similarly, two $5 dollars from one person are worth the same as a single $10 bill from another.

Gold is another fungible asset, as one ounce of gold in one country has the same value as one ounce of gold in another. The issue over fungible vs. non-fungible tokens stems from fungibility being written into Bitcoin and another cryptocurrency programming. The most significant feature of a fungible good is standardized, and its units are not unique.

NFTs, on the other hand, function as a unique token version with no interchangeability with other tokens, as discussed in the debate between fungible and non-fungible tokens. NFT has specific characteristics that indicate that it cannot be replaced or exchanged for another token of the same type.

Non-fungible tokens vary from cryptocurrencies in the way they have no intrinsic value. Non-fungible tokens derive their value from the assets or things they represent. NFTs use a variety of token standards and employ a variety of smart contract types. Non-fungible tokens are seen as cutting-edge instruments for creating a blockchain-based virtual economic environment.

Now that we understand what fungible and non-fungible tokens are, it's time to compare fungible and non-fungible tokens. Let us consider the characteristics that distinguish fungible and non-fungible tokens:

- Interchangeability:

  As you may have guessed, Fungible tokens are interchangeable with one another. Fiat currencies are the most well-known example of fungible assets. You can transfer fungible assets to make payments for

particular things from one owner to another. On the other hand, exchanging fungible assets has no meaning because they have the same worth. Payments and balance tracking are common uses for fungible tokens.

Binding fungible tokens to an organization's account balance in a specific payment account is one of the most recognized practical blockchain use cases of fungible tokens. As a result, token transfers could be used to fulfil payments. Users can also query the resultant token balances to perform periodic netting and settlement.

- Value Transfer:

  Each account maintains a balance based on the tokens it owns—using direct transactions or swap mechanisms to move tokens to other Ethereum accounts. When using token transfers, the source account is debited with the transfer amount, just like when using bank transfers. At the same moment, a credit of the same amount is applied to the beneficiary account.

  When comparing fungible and non-fungible tokens, it's clear that non-fungible tokens, or NFTs, offer a distinct value proposition. NFTs are one-of-a-kind tokens, and each one has its own unique ID for distinguishing it from other tokens in the same smart contract. Because each token is treated differently, each non-fungible token has a unique owner. As a result, their values may change.

  Certain NFTs can represent one-of-a-kind tributes with a proven scarcity. As a result, NFTs are in high demand, with more buyers and higher value than those expressing common features. Furthermore, NFTs may be used to facilitate both ownership transfer and trading. For example, John may swap tokens representing a batch of Scottish whisky for tokens representing a batch of Bordeaux wine.

  The assignment of a non-fungible token to a real estate property is one of the most noteworthy use cases. After paying off the mortgage, users can transfer NFTs from the tenant's wallet address, and Ethereum account to the house owner's Ethereum account. As a result, it presents a new type of use case for blockchain in the real estate market.

Difference between fungible and non-fungible tokens

The difference between fungible and non-fungible tokens on the basis of criteria such as interchangeability, value transfer, divisibility, and the token standard is discussed in *Table 2.1*.

The difference between fungible and non-fungible tokens is:

Criteria	Fungible Tokens	Non-Fungible Tokens
Interchangeability	Fungible tokens are easily interchangeable, but there is no additional value in doing so.	Each token represents a unique value; non-fungible tokens are not interchangeable.
Value Transfer	The quantity of tokens in a person's possession determines the value transfer.	The value of the one-of-a-kind asset represented by NFT is useful in transferring value.
Divisibility	Fungible tokens can be broken down into smaller pieces, and the smaller pieces can be used to assist pay off bigger payments.	NFTs are not divisible, and their value is based on the entire.
Token standards	The ERC-20 standard is used by fungible tokens.	The ERC-721 standard is used by non-fungible tokens.

Table 2.1: *Difference between fungible and non-fungible tokens*

Token standards

Tokens are digitally transferred assets between two people in the Blockchain network. Tokens can be native to a blockchain, such as BTC, which is Bitcoin's native token, or they can be created and hosted on an existing blockchain using a smart contract. Stablecoins are tokens that track the price of fiat currencies (for example, USD, EUR). Others, known as NFTs, can be used to represent collectibles or works of art. Tokens can represent ownership rights to real-world properties or businesses (that is, stock tokens). Here, we will explore several types of tokens available on Tezos and the token standards.

To be compatible with common standards, a smart contract must adhere to a token standard, an interface, and a set of rules. On the Tezos network, token standards typically define how tokens can be exchanged and how to keep a consistent record of those transactions.

Multiple implementations of a standard can exist side by side, but they must

all adhere to the standard's interface and rules. Standards ensure that smart contracts remain interoperable so that when a new project releases a token, it can be used with current decentralized exchanges, wallets, and other services. *Figure 2.2* shows token standard:

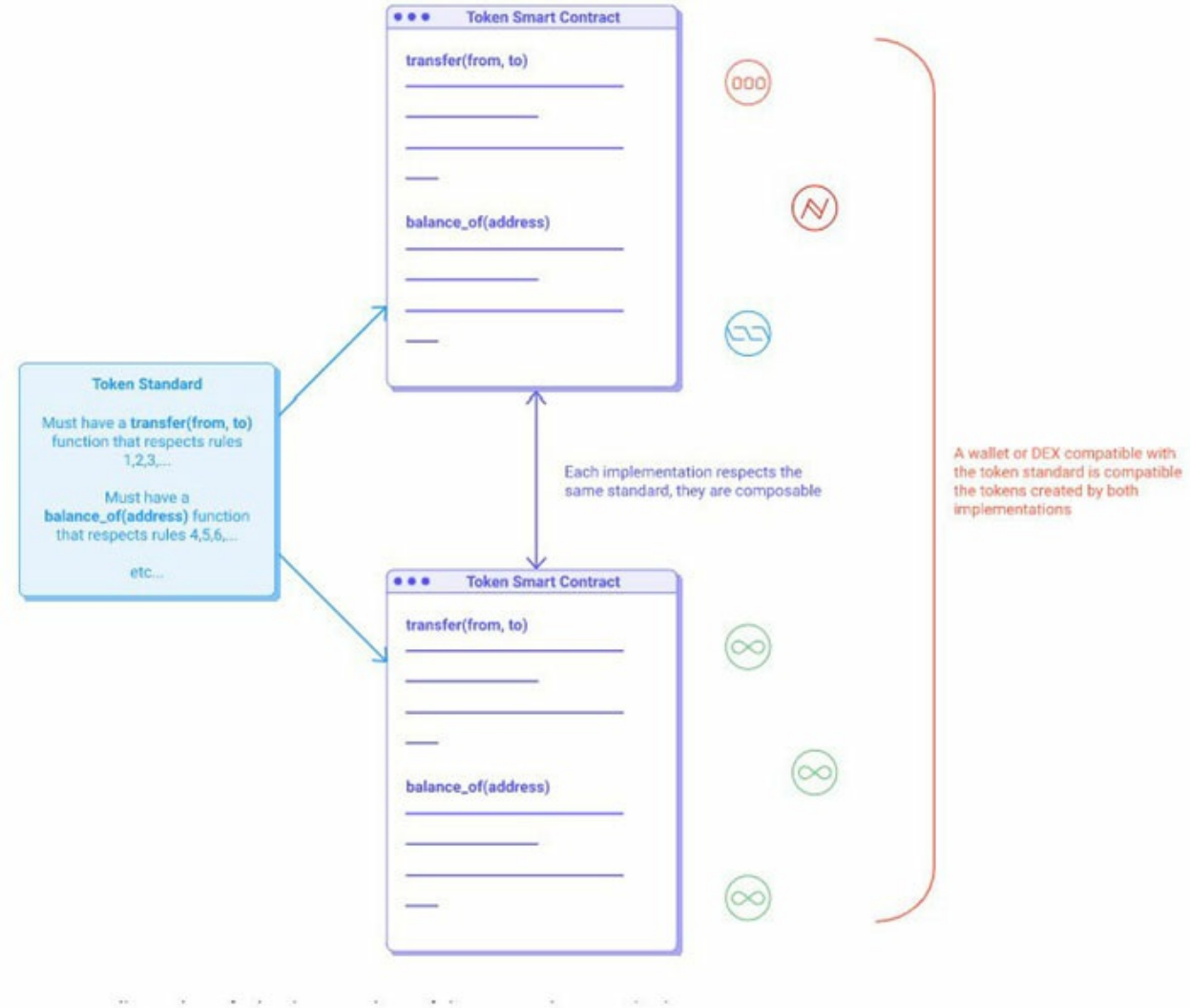
Token Smart Contract
transfer(from, to)
balance_of(address)
Token Standard
Must have a transfer(from, to) function that respects rules 1,2,3,...
Must have a balance_of(address) function that respects rules 4,5,6,...
etc...
Each implementation respects the same standard, they are composable
Token Smart Contract
transfer(from, to)
balance_of(address)
A wallet or DEX compatible with the token standard is compatible the tokens created by both implementations

Figure 2.2: *Token standards*

Token standards are a collection of regulations that allow cryptocurrency tokens to be developed on various blockchain technologies.

Let us look at the most common Ethereum token standards and their functions and three additional blockchain platforms that have produced their own token standards.

On Ethereum, there are some common token standards.

The **Ethereum Request for Comment** (**ERC**) specifies the Ethereum

ecosystem's application-level designs and practices. Smart contract standards, such as token specifications (ERC20), frequently accompany a reference implementation. ERC is a set of regulations that Ethereum-based tokens must follow.

Common ERC standards offer a set of needed functions for a token type, allowing applications and smart contracts to interact with it predictably.

Most widely used and relevant ERC token standards.

Some of the most widely used and relevant ERC token standards are shown in *Table 2.2*. The most widely used and relevant ERC token standards are:

Standard Name	Created On	Use Case
ERC-20	19/11/2015	It's a fungible token standard which provides basic functionality to transfer the token and allows tokens to be approved.
ERC-721	24/01/2018	Non-Fungible token standard.
ERC-777	20/11/2017	It's a standard which defines all the functions which are required to send tokens on the behalf of another address, contract or account.
ERC-1155	17/06/2018	It's a standard which manages multiple token types.

Table 2.2

Token standard ERC20

For Ethereum-based tokens, ERC20 is the most widely used standard. It's a technical standard for Ethereum-based tokens that lays out criteria that all Ethereum-based tokens must follow.

The ERC-20 is a simple interface for creating Ethereum tokens that may be reused by other apps such as DeFi.

ERC-20 is also a fungible token standard, which means that any token (or part of a token) is identical to and indistinguishable from the next. For

example, Sehdev’s $1 is the same as Rajan's $1, indicating that the USD is interchangeable and of identical worth. One bitcoin equals all other bitcoins, just as fiat currency is fungible.

To comply with the ERC20 token standard, the following six primary functionality must be implemented:

- **`total supply()`**: Returns the total token supply of an ERC20 token.
- **`balanceOf()`**: Keeps track of each Ethereum wallet's token balance.
- **`transfer()`**: This function sends the token to the recipient’s wallet address from the signed wallet address. Internally, this method verifies that the sender’s wallet address has enough funds available or distribute them to ICO investors after they've been created.

After the initial distribution, **`transferFrom()`** allows token holders to exchange tokens with one another.

Function of transferFrom()

"**`transferFrom()`**" is a function in the Ethereum blockchain that is used for transferring ownership of a token from one address to another. This function is commonly used for transferring NFTs between users on the Ethereum network.

The "**`transferFrom()`**" function is defined in the smart contract of the token, and it is typically used as part of the implementation of the ERC-721 or ERC-1155 token standards. The function takes three parameters: the address of the current owner of the token, the address of the new owner, and the token ID of the NFT being transferred.

Once the transfer is complete, the ownership of the NFT is transferred from the current owner to the new owner. This is a permanent change and cannot be undone, making NFTs a secure and immutable form of digital ownership.

In the NFT space, the "**`transferFrom()`**" function is an important part of the process for buying, selling, and trading NFTs. By using this function, users can transfer ownership of their NFTs to other users in a secure and transparent manner, enabling the creation of a vibrant NFT marketplace.

The functions used to approve the token are:

- **`Approve()`**: This function is used to "approve" other accounts to withdraw a specific quantity of tokens from the account calling it.

- **`Allowance()`** is called after approval() to determine how many tokens the approved account is permitted to withdraw from the original account.

Token Name, Ticker Symbol (for example, ETH), and Adjust the Divisibility of the Token are three simple optional functions for the ERC20 (how many decimals places your token will support).

Furthermore, between 2016 and 2018, ERC20 was the currency of choice for many initial coin offerings (ICOs), resulting in the ICO boom and spawning many of the altcoins we have today. ChainLink (LINK), Dai (DAI), and Basic Attention Token are examples of ERC20 tokens (BAT).

Please keep in mind the connection between ETH (ether) and ERC20. ETH is the Ethereum blockchain's native token, and it serves as the network's fuel, as each action on the Ethereum blockchain requires the payment of a proportional amount of 'gas.' Gas prices are expressed in gwei, which are minuscule fractions of ether (1 gwei = 0.000000001 ETH). While ERC20 is the standard to follow when creating applications (smart contracts), the ERC20 token is the currency used to access the app.

Token standard ERC721

ERC721 is a token standard that defines NFTs on the Ethereum blockchain instead of ERC20 for fungible tokens. Non-fungible tokens, or NFTs, are a particular sort of cryptographic token in that their specifications prevent them from being interchanged. NFTs contain distinct properties that distinguish them from one another, allowing them to be used to represent collectibles, game goods, digital art, event tickets, domain names, and physical asset ownership records. *Figure 2.3* shows the pictorial difference between a Fungible and Non-Fungible Token:

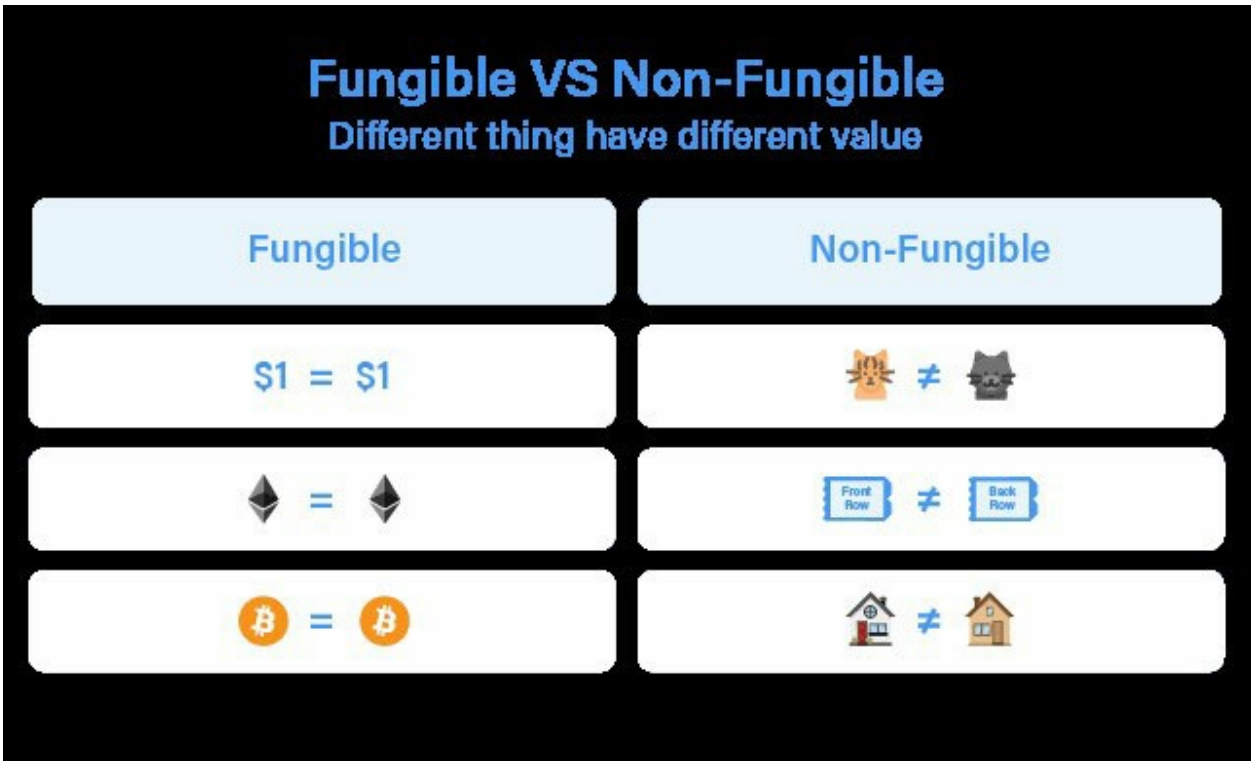

Figure 2.3: *Fungible VS Non-Fungible Token*

CryptoKitties is a game established on the Ethereum blockchain in 2017 that allows users to buy, sell, and digitally breed cats known as CryptoKitties which is one of the most popular NFT initiatives. NFTs can now be traded on OpenSea, Crypto.com's NFT Gallery, and Rarible.

The ERC721 token standard specifies the minimum interface that a smart contract must provide to manage, own, and trade crypto collectibles.

Token standard ERC777

The ERC-777 Token Standard intends to solve the constraints of the ERC-20 Token Standard while remaining backward compatible. It specifies advanced token interaction features. To provide token holders additional control over their tokens, operators can transmit tokens on behalf of another address and use send/receive hooks. Meanwhile, it allows a user to reject incoming tokens from an address that has been blacklisted.

Token standard ERC1155

Token standards like ERC20 and ERC721 necessitate the deployment of a

different contract for each token type or collection. Isolating each token contract into its permission address creates a lot of redundant byte code on the Ethereum blockchain and inhibits some capabilities. The growth of contracts would cause performance and cost issues with the rise of blockchain games that use NFTs as in-game assets. *Figure 2.4* shows ERC1155 Token Standard:

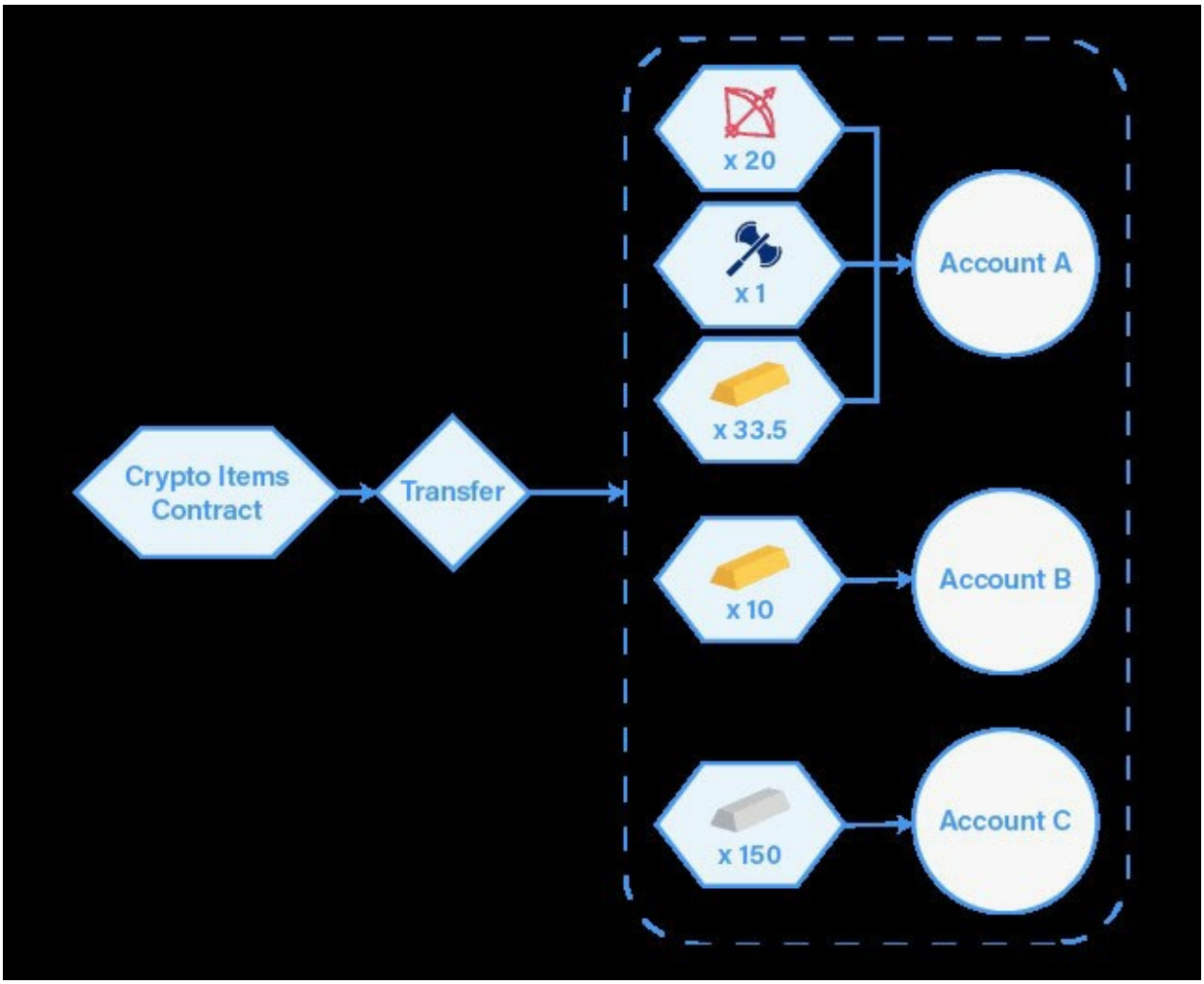

Figure 2.4: *ERC1155 Token Standard*

ERC1155 is a protocol for managing numerous token kinds in contracts. You can transfer various token types (ERC20 and ERC721) simultaneously with ERC1155, reducing transaction costs. Multiple token trading can be developed on top of this standard, eliminating the requirement for individual token contracts to be approved separately. In a single contract, it's also easy to specify and combine numerous fungible and non-fungible token kinds.

Token standards for other blockchains

Smart contract protocols are now used in a variety of ways; in essence, everyone has their own set of rules. In addition to Ethereum, other blockchain projects focus on generating smart contracts. The following figure shows Token Standards for EOS:

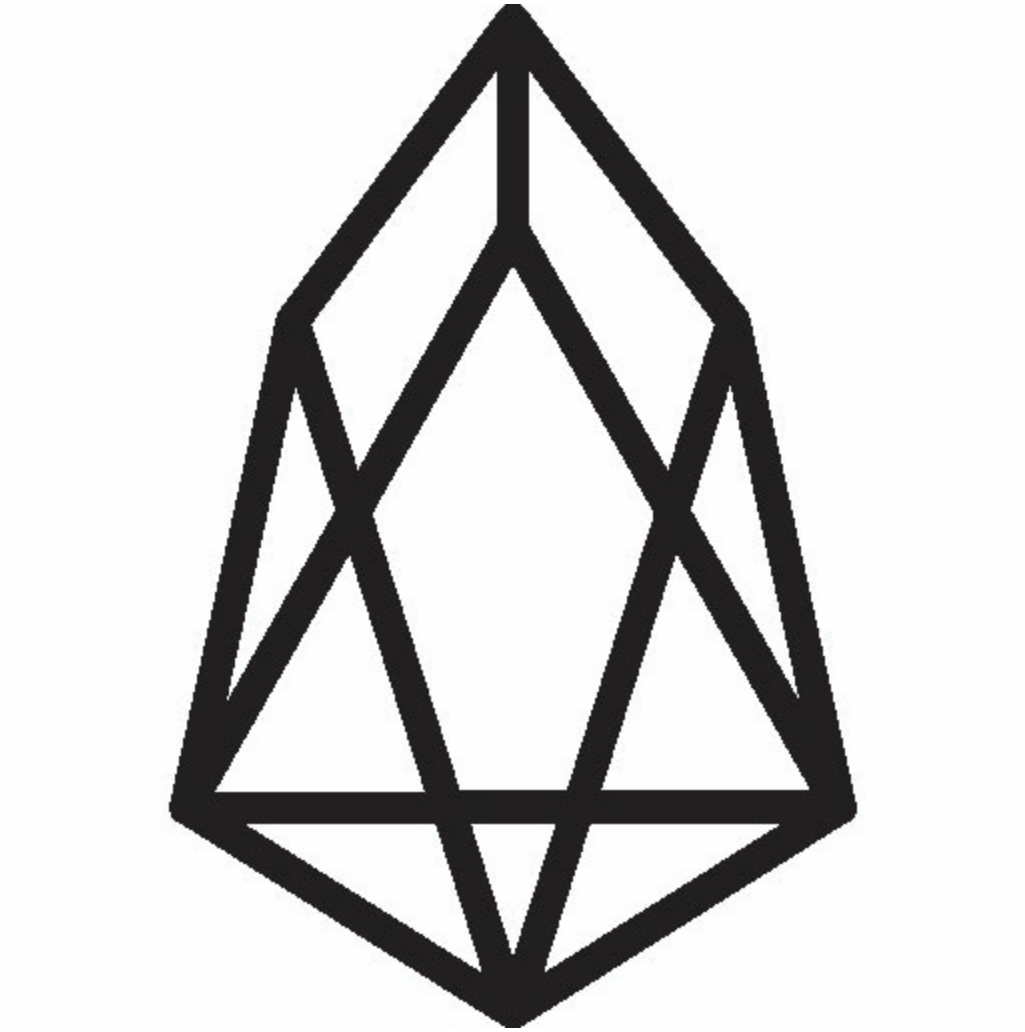

Figure 2.5: *Token Standards for EOS*

EOSIO is a blockchain platform that is not the same as Ethereum. Consensus, fee schedules, account creation and update, token economics, block producer registration, voting, multi-sig, and other basic blockchain functionalities are implemented inside smart contracts deployed on the EOSIO platform blockchain.

The EOSIO open-source platform, which comprises the system contracts

encapsulating the underlying functionality for an EOSIO-based blockchain, is implemented, and maintained by Block.one (the EOSIO development team).

eosio.bios, *eosio.system*, *eosio.msig*, *eosio.token*, and *eosio.wrap* are among the system contracts supporting the system's core functionalities. EOS employs the *eosio.token* smart contract, whereas Ethereum uses the ERC20 smart contract. It specifies the structure and operations that users can utilize to produce, issue, and manage EOSIO tokens. The same contract is used to issue EOS tokens on the EOS blockchain.

In addition, third-party frameworks were used to achieve it for various token kinds, such as NFT. For example, CryptoLions' Simple Assets and Mythical Games' dGoods are two non-fungible token standards for EOSIO. *Figure 2.6* shows Token Standards for NEO:

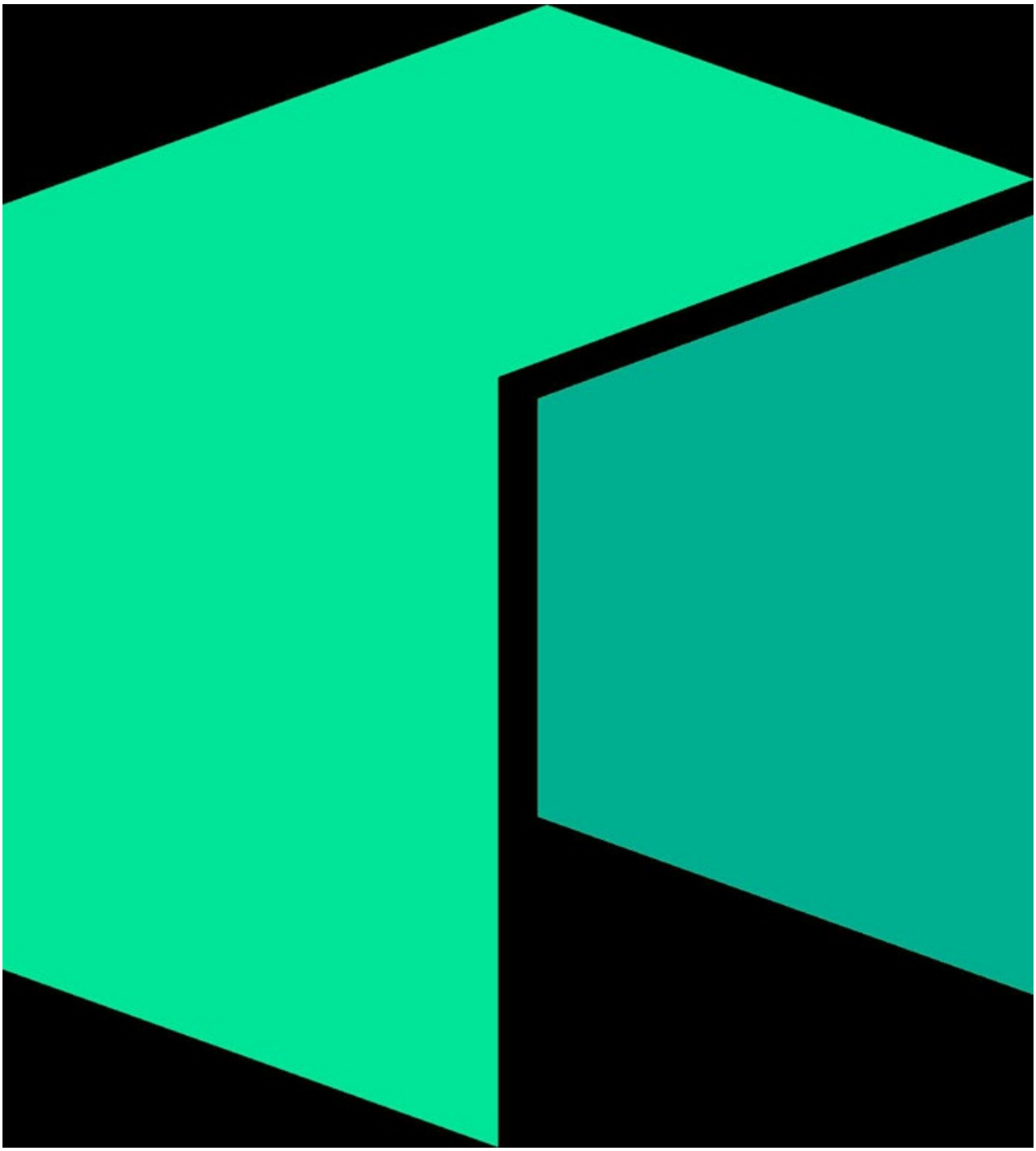

Figure 2.6: *Token Standards for NEO*

Another project aiming to construct the infrastructure for smart contracts is NEO. NEPs (NEO Enhancement Proposals) specify NEO platform standards like as core protocol definitions, client APIs, and contract standards.

The NEP5 proposal defines a token standard for the Neo blockchain that allows systems to interface with tokenized Smart Contracts more broadly.

The NEP10 standard is used to create its NFTs.

Token standards for Tezos

Tezos Interoperability Proposals (**TZIP**) are publications that describe how the Tezos blockchain can be improved with new and updated standards and concepts, such as smart contract specifications.

TZIP7 implements token transfer operations and authorization for spending tokens from other accounts. As a useable specification in the Tezos ecosystem, it was a closer approximation of the ERC20. TZIP12 was designed as a Multi-Asset interface to free Tezos developers from relying on token-specific standards. TZIP12 provides a universal token contract interface that supports a wider range of token types, including fungible and non-fungible tokens such as ERC1155.

Tezos is an open-source application and asset platform backed by a global community of developers, academics, and validators. Tezos claims that its platform tackles a number of important concerns that are crucial to the adoption of blockchain technology. Tezos prioritizes long-term upgradeability, smart contract security, and open involvement. *Figure 2.7* shows Token Standards for Tezos:

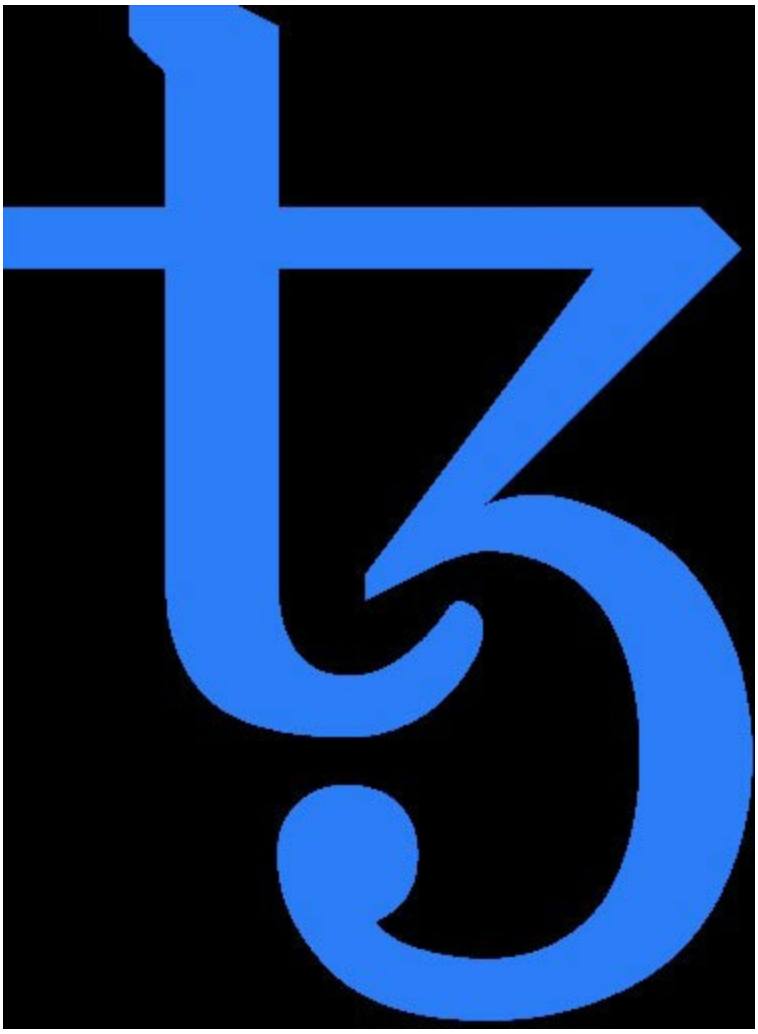

Figure 2.7: *Token Standards for Tezos*

Upgradability in the long run

Tezos is built on a modular architecture. The platform also features a formal upgrading process in addition to this framework. These two characteristics enable platform users to choose important changes and deploy them as needed. As a result, the network will be able to absorb new technical improvements as soon as they become available.

Tezos' on-chain invoicing system is also an important component that allows the network to adapt in the long run. This permits the protocol to stay current even in the long run while maintaining community consensus.

Smart Contracts that are safe

Tezos places a strong emphasis on the security of their smart contracts on their website. The platform intends to offer developers secure contracts based

on code correctness. This indicates that the platform's contracts are appropriate for assets and high-value use cases.

The Michelson language is used to write contracts, which makes formal verification easier. This strategy is utilized in mission-control situations such as the nuclear and aerospace industries. This highlights the relevance of smart contracts as well as their security capabilities.

SmartPy and Michelson are both programming languages used for writing smart contracts on the Tezos blockchain. However, as mentioned earlier, they differ in their level of abstraction and ease of use.

Michelson is a low-level, stack-based programming language that is designed for writing highly efficient and secure smart contracts. It is similar to assembly language in terms of its level of abstraction and is often considered challenging to use, particularly for developers with little experience in low-level programming.

On the other hand, SmartPy is a higher-level programming language that is designed to make it easier to write smart contracts on the Tezos blockchain. It is implemented in Python, which is a more widely used and well-known programming language, and provides a higher level of abstraction and easier-to-use features compared to Michelson. With SmartPy, developers can write smart contracts using a more familiar and user-friendly syntax, making it easier to get started with writing smart contracts on the Tezos blockchain.

Open Participation

Another fascinating component of Tezos is how its "liquid" delegated proof-of-stake structure allows the community to make key decisions. All network stakeholders are invited to participate in the planned network modifications. The stakeholders can propose, evaluate, and approve changes to the network. This varies from **Proof-of-Work** (**PoW**) and other **Proof-of-Stake** (**PoS**) networks because all stakeholders may contribute to keeping the system safe through baking or delegation. This is also a way to protect stakeholders from being weakened by network inflation.

"Liquid Democracy" by Tezos

Tezos is frequently compared to Ethereum since it is a decentralized blockchain platform that can be used to develop decentralized applications (dApps). Tezos, on the other hand, uses a Proof-of-Stake consensus process, which eliminates the requirement for miners.

When compared to Ethereum, another key difference is that Tezos aspires to be a more "democratic platform." Tezos' "liquid" delegated proof-of-stake technology is used in this system, which is frequently referred to as "liquid democracy" or "liquid government." This implies that all stakeholders are included in the decision-making process for new services and enhancements. This means that any user may make proposals for upgrades, which they can subsequently submit and price. Through a voting method, the network chooses whether or not the platform should implement this upgrade. If the network accepts the update, the individual who modified it will be compensated the same amount as the price tag.

The platform will not require significant and extensive modifications due to this approach, which might render programs unworkable. This technique may also assist in lessening the likelihood of any Tezos blockchain hard forks. When a firm that owns a blockchain disagrees, a hard fork might arise. In the case of Tezos, the platform users make all of the choices, and arguments inside the Tezos Foundation have no bearing. This is referred to as self-amendment, and the fundamental reason for this is that it allows the blockchain to be updated more efficiently without dividing the community.

Ethereum token

Tokens are used in Ethereum, a popular cryptocurrency and blockchain system. Tokens can be bought, sold, or traded. Ethereum was first released in 2015, and since then, it has become one of the most popular cryptocurrencies. Tokens represent a wide range of digital assets in the Ethereum system, including vouchers, IOUs, and even real-world, physical objects. Ethereum tokens are essentially smart contracts that run on the Ethereum network.

What is an Ethereum token?

This is what Ethereum token is all about:

- Tokens are used in Ethereum, a popular cryptocurrency and blockchain system. Tokens can be bought, sold, or traded.
- ERC-20, which has emerged as the technical standard for all smart contracts on the Ethereum blockchain for token implementation, is one of the most important tokens.

- The ERC-20 standard is used by a number of well-known digital currencies, including **Maker** (**MKR**), **Basic Attention Token** (**BAT**), **Augur** (**REP**), and the **OMG Network** (**OMG**).

ERC-20

The ERC-20 token is one of the most important Ethereum tokens. ERC-20 has emerged as the technical standard; it is used for all smart contracts on the Ethereum blockchain for token implementation and establishes a set of rules that all Ethereum-based tokens must follow. ERC-20 tokens are blockchain-based assets with value that can be sent and received, comparable to bitcoin, Litecoin, and any other cryptocurrency in some ways. The main distinction is that ERC-20 tokens are issued on the Ethereum network rather than on their blockchain.

The ERC-20 standard defines a set of rules

On Ethereum's main network, roughly 508,074 ERC-20-compatible tokens exist as of March 24, 2022.

The ERC-20 is crucial because it establishes rules that all Ethereum coins must follow. How tokens can be moved, how transactions are approved, how users can access data about a token, and the total number of tokens are only a few of the rules.

As a result, this token enables all types of developers to precisely forecast how future tokens will behave within the Ethereum system. This makes the task for developers easier; they can go on with their work knowing that no new projects will need to be created every time a new token is launched, as long as the token meets the rules. This compliance is also required since it assures that the many different tokens created on Ethereum are compatible.

Fortunately, most token developers have adopted the ERC-20 standard, which means that the bulk of tokens issued through Ethereum’s initial coin offerings is ERC-20 compliant.

Maker (MKR), Basic Attention Token (BAT), Augur (REP), and OmiseGO are just a few of the well-known digital currencies that follow the ERC-20 standard. If you want to buy any digital currency released as an ERC-20 token, you'll need a wallet which is compatible with these tokens. Fortunately, because ERC-20 tokens are so popular, there are many wallet solutions.

Burn functionality

The "burn" functionality is a process in which tokens are permanently destroyed or removed from circulation. This can occur in various scenarios, such as during a token swap, staking, or payment.

In token swaps, the "burn" functionality is used to remove the old tokens from circulation and replace them with new tokens. This helps to maintain the overall supply of tokens and ensure that the value of the new tokens is not diluted by the old tokens.

In staking, the "burn" functionality is often used as a penalty mechanism for misbehavior or non-compliance. For example, if a stalker fails to follow the rules of the staking protocol, the tokens they have staked may be burned as a punishment.

During payments, the "burn" functionality is used to reduce the overall supply of tokens. For example, if a user wants to pay for a product or service using a token, they may need to burn a certain number of tokens to complete the transaction. This can help to maintain the overall value of the token and ensure that it is not diluted by frequent transactions.

Six different coding functions are specified by ERC-20

For the benefit of other tokens in the Ethereum system, ERC-20 defines six distinct implementation coding functions.

The six basic code functions for ERC-20 token implementation are as follows:

- total supply
- balance of
- allowance
- transfer
- approve
- transfer from

These code functions are critical for user/token implementation, including determining the number of tokens in circulation, storing and returning balances, requesting and approving transfer and withdrawal requests, and agreeing to automatic transfers.

This set of functions and signals, when combined, ensures that Ethereum

coins of various sorts work consistently in any location within the Ethereum system. As a result, practically every digital wallet that accepts ether accepts ERC-20-compliant tokens.

Conclusion

We studied tokens, fungible, and non-fungible tokens in this chapter. A synonym for "cryptocurrency" or "crypto asset" is "token." However, depending on the context, it has a few more precise interpretations. It specifies specific digital assets that, like many decentralized financial tokens, run on top of the blockchain of other cryptocurrencies. Decentralized programmes can sell virtual properties and automate interest rates with the use of tokens. Like any other cryptocurrency, tokens can be stored or exchanged.

Then, we discussed tokens and their importance, the difference between tokens, fungible, and non-fungibility, token standards, Ethereum, and Tezos tokens.

In the end, we discussed the ERC-20 token, which is one of the most important Ethereum tokens. ERC-20 has emerged as the technical standard; it is used for all smart contracts on the Ethereum blockchain for token implementation and establishes a set of rules that all Ethereum-based tokens must follow.

Key Terms

- **Tokens:** Virtual currencies representing fungible and tradeable assets or utilities on blockchains.
- **EOSIO:** Open-source platform, which comprises the system contracts encapsulating the underlying functionality for an EOSIO-based blockchain.
- **ERC-20:** Token is one of the most important Ethereum tokens. ERC-20 has emerged as the technical standard; it is used for all smart contracts on the Ethereum blockchain.

Multiple Choice Questions

1. **Tokens are:**
    a. Cryptocurrencies which represent a specific asset and are stored on their blockchain.
    b. Used to invest in, store value, or make purchases.
    c. Digital currencies that are used to facilitate blockchain transactions
    d. All of the above
2. **_____ are the specialized DeFi tokens that provide holders with a say in the future of a protocol or program that does not have boards of directors or any other central authority.**
    a. Governance Tokens
    b. Non-fungible Tokens
    c. Security tokens
    d. Utility Tok.ens
3. **The first fungible tokens, _____, were created on the Ethereum network.**
    a. ERC-19
    b. ERC-20
    c. ERC-21
    d. ERC-22
4. **CryptoKitties first surfaced in _____ on the Ethereum blockchain.**
    a. 2015
    b. 2016
    c. 2017
    d. 2018
5. **The _____ Token Standard intends to solve the constraints of the ERC-20 Token Standard while remaining backward compatible.**
    a. ERC-774
    b. ERC-775

c. ERC-775
d. ERC-777

Answers

1. **d**
2. **a**
3. **b**
4. **c**
5. **d**

Join our book's Discord space

Join the book's Discord Workspace for Latest updates, Offers, Tech happenings around the world, New Release and Sessions with the Authors:

https://discord.bpbonline.com

CHAPTER 3

About NFTs

You studied Tokens in *Chapter 2, Understanding Tokens, Fungible and Non-Fungible*; Since Bitcoin and Ethereum are the two cryptocurrencies that are by far the most important and encompass all other cryptocurrencies, a "token" is any cryptocurrency that is neither Bitcoin nor Ethereum.

"Tokens" are crypto assets that run on top of the blockchain of another cryptocurrency. This phrase will appear if you are interested in decentralized finance (or DeFi). Chainlink and Aave are two examples of DeFi coins that function on top of or make use of an existing blockchain, most frequently Ethereum's.

These tokens support decentralized applications in a variety of ways, such as automating interest rates and trading virtual properties. The same as with any other cryptocurrency, they may be bought and traded.

You will learn about NFTs and the similarities between NFT programming and that of cryptocurrencies like Bitcoin or Ethereum in this chapter.

Physical money and cryptocurrencies are both "fungible," which means they may be exchanged or swapped. Cryptocurrency provides a safe mechanism to carry out blockchain transactions due to its fungibility.

Unlike other materials, NFTs are unique. Each has a digital signature that stops NFTs from replacing or comparing them.

So, let us get started and thoroughly examine the significance and background of NFTs.

Structure

In this chapter, we will cover the following topics:

- Importance of NFTs
- Value of collectibles
- Digital art before NFTs

- Advantages of NFTs
- Beginning of NFTs
- History of digital art
- Digital art: a real art
- CryptoKitties
- Introduction to the wallet

Objectives

After studying this chapter, you should be able to:

Learn about the importance of collectibles and problems with traditional art, collectibles, and memorabilia. After this, understand the digital art before NFTs, and from where the NFTs begin and at the end, learn Andy Warhol's pop art, Beeple's cyberpunk works meet NFTs and then understand the Story of Digital Art, CryptoKitty, and Wallet.

Importance of NFTs

The use of non-fungible tokens is growing. These devices have proven to be the perfect digital alternative for collecting tokens. They commonly mimic real-world elements, including in-game items, music, art, and movies. These digital tokens are unique and cannot be exchanged for money. However, you can use them for a range of transactions, like the exchange of digital cash and artwork. *Figure 3.1* shows the importance of NFTs:

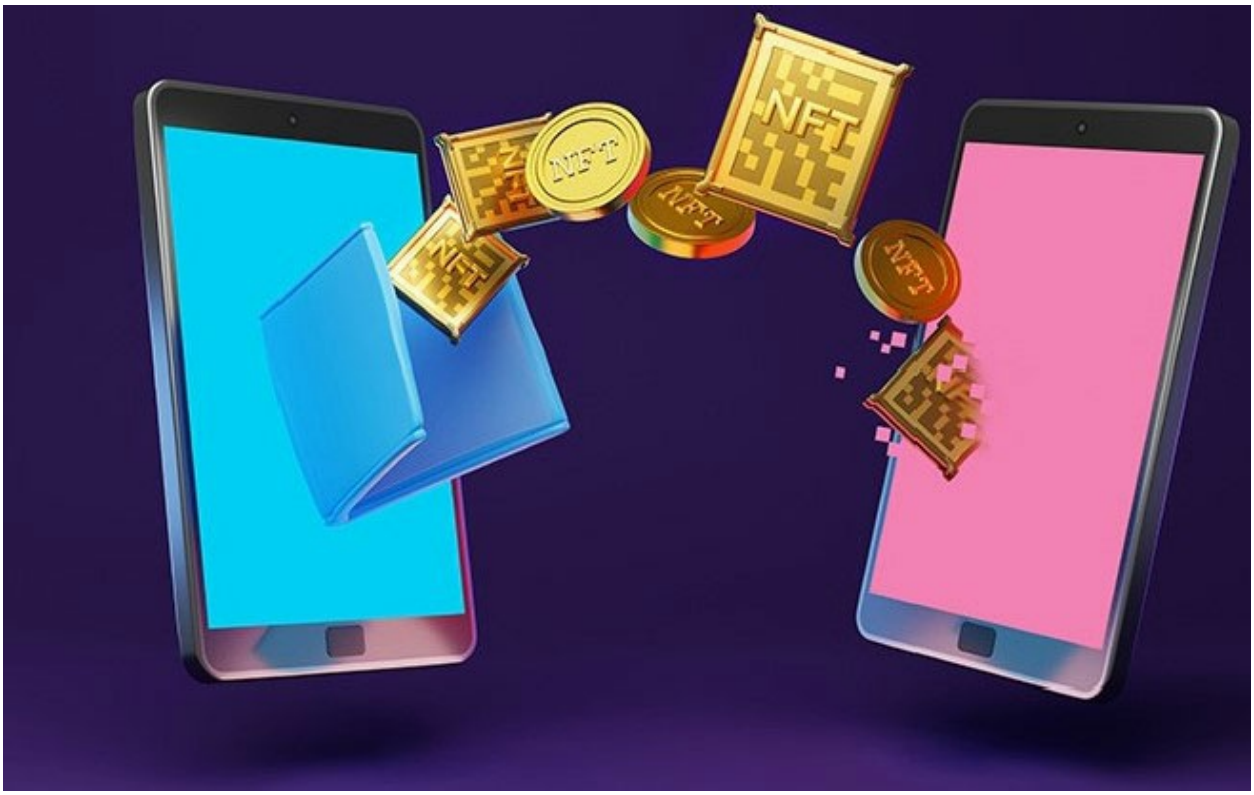

Figure 3.1: *Importance of NFTs*

Importance of NFTs to the bitcoin world

Let's look at the importance that NFTs provide to the bitcoin world. In the bitcoin world, the NFTs can be used as follows:

- Authenticity is improved

  NFTs are unique because of the importance of the blockchain in their production. Blockchain technology typically refers to the use of certain data. A greater value addition is possible as a result of these particular qualities. NFT producers also set limits on their output, which causes a shortage of the product.

  Because of their greater immutability, NFTs are more valid. They are unaffected by removal, replacement, or modifications because of blockchain technology.

- Possessing the ability to demonstrate ownership

  Non-fungible token ownership is simple to prove. This is true since they are stored on a separate blockchain network. Because of their non-distributable characteristics, clients are protected against getting phoney

digital assets.

Furthermore, there are a number of steps involved in determining who is the owner of any NFT you may have. The technology used forces you to demonstrate that you possess the real deal, guaranteeing a higher ownership value. Theoretically, NFTs make it simpler to establish and retain asset ownership. *Figure 3.2* shows the importance of NFTs in the bitcoin world:

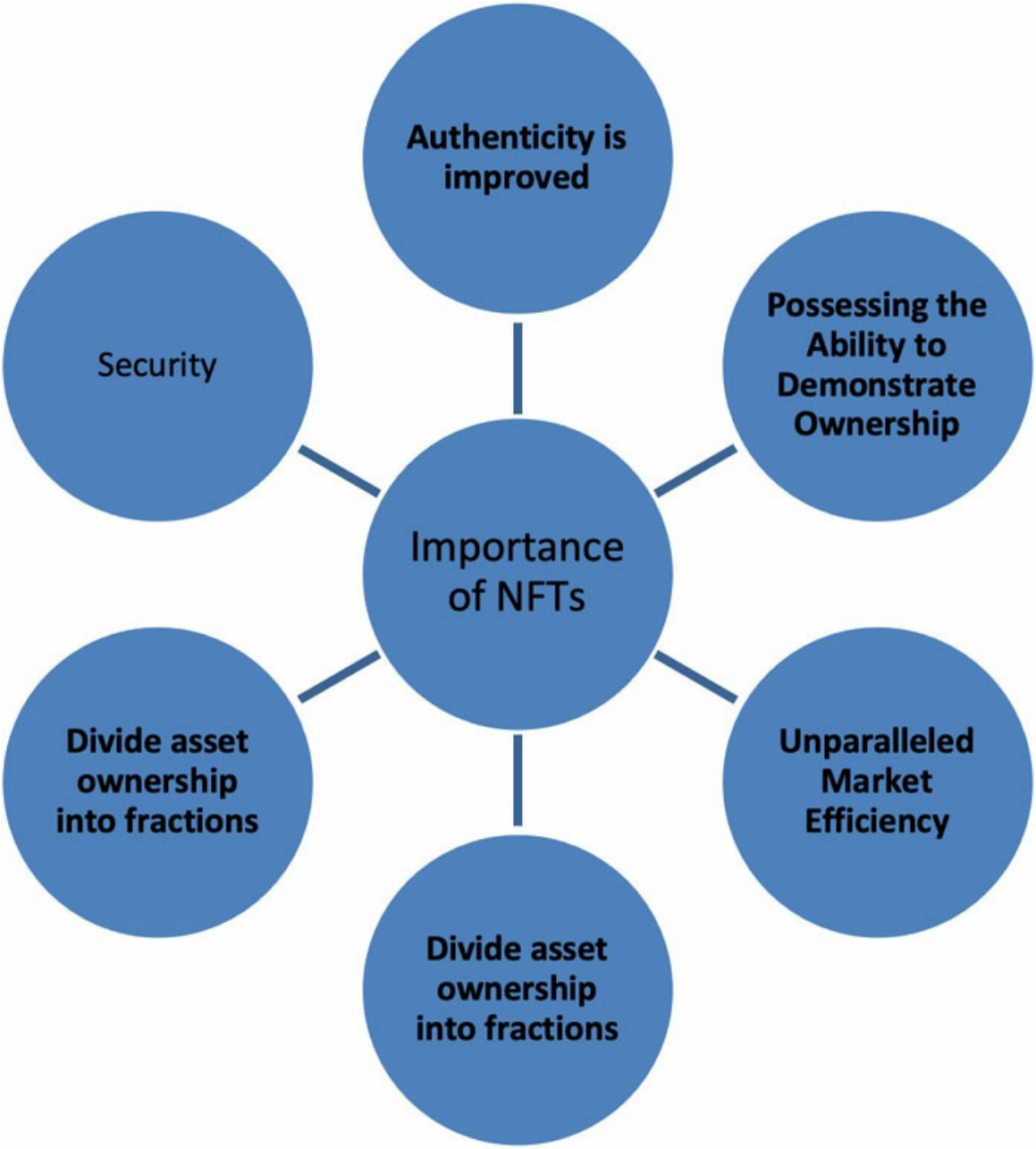

Figure 3.2: *Importance that NFTs provide to the bitcoin world*

- Unparalleled market efficiency

  NFTs are designed to increase market efficiency, especially when it comes to cryptocurrencies. Theoretically, you can use these devices to convert physical assets into digital assets, cutting out intermediaries and improving supply chains.

  Additionally, you'll be in a better position to effortlessly communicate with cryptocurrency buyers and sellers. Indirect costs and complexity are decreased by eliminating intermediaries. You will deal directly with the buyers and sellers, therefore there won't be any agency costs. When exchanging USD coins on Rubix, no agent shows up. NFTs may be used to handle and store private cryptocurrency data.

- Divide asset ownership into fractions

  Consider a scenario in which you only wish to sell a share of a single bitcoin token. Use NFTs, which enable you to divide your assets into smaller portions, in this situation. The management of tangible assets may also be done using this manner. The purpose of digitizing your thing is to divide its worth, whether it be digital or physical, into shared copies.

  NFTs can be transferred simultaneously. You can freely exchange NFTs using this capability on a variety of marketplaces. Ownership may be transferred through smart contracts, a feature of blockchain that is gaining popularity. However, this transfer will only be effective if both the buyer and the seller meet specific conditions. NFTs, on the other hand, are not divisible into smaller amounts.

- Security

  Everyone is looking forward to having their digital assets to be more secured. Fortunately, NFTs offer unrivalled safety and security. Thanks to blockchain, you may rest assured that you will be protected against fraud in the long run.

- Inclusivity should be improved

  Although cryptocurrencies promise to broaden diversity, they have not yet reached their full potential. These NFTs create an environment that unites traders and innovators from various industries. Creators are able to earn a sizable sum of money for their work because of the similar pool. Additionally, it makes it simple for these creators to conduct

cryptocurrency transactions.

Buyers have access to a range of electronic assets, including cryptocurrencies, through NFT platforms or marketplaces such as OpenSea, Rarible, NBA Top Shot, Binance, and many more. Future growth is made possible by the freedom that comes with controlling these assets. NFT enables many buyers to hold shares in a single business concurrently. Shared ownership is necessary since cryptocurrencies are becoming more and more valuable.

Value of collectibles

A collectible is a product that has increased value due to its scarcity and/or popularity since it was first offered. A collectible's price is typically decided by the quantity and quality of comparable items in the market.

Collectibles include items like coins, comic books, toys, stamps, and antiques. Collectibles are carefully gathered and stored by their owners in safe locations over the course of a lifetime.

As mentioned previously, collectibles are items that frequently fetch more prices at auction than they did at first. A collectible may sell for a high price if it is rare. The condition of a collection also affects its price. A collectible's value may rise if it is in outstanding condition. However, if something has degraded through time, it probably won't be worth much at all.

Marketers might have assumed that collectibles are widespread and make good investments. The business will eventually notice the market signal and boost production if the product is still being made in order to satisfy demand.

The store of value that makes most products collectible doesn't become apparent for many years, if ever. Certain commodities become collectible when their quantity decreases via attrition after a production run is finished because of their relative scarcity. *Figure 3.3* shows various collectibles:

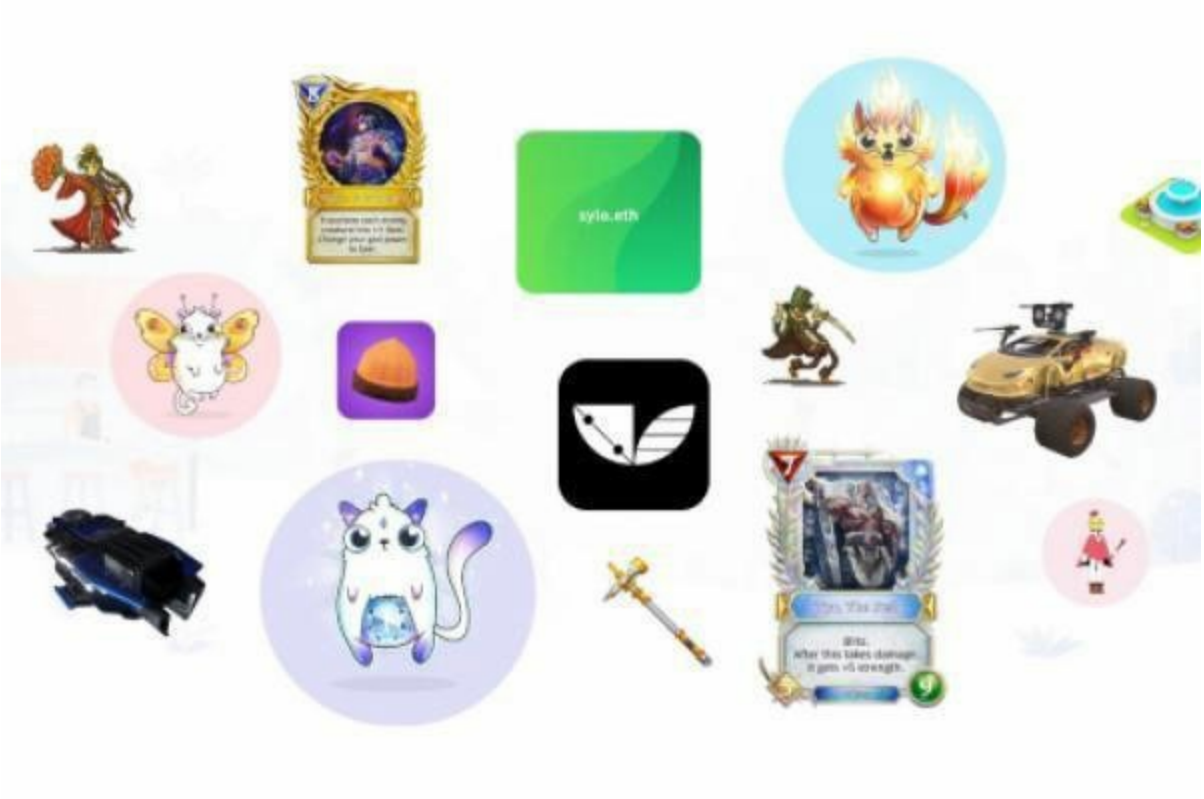

Figure 3.3: *Collectibles*

Collectibles are typically used to describe brand-new, mass-produced items that are for sale. This is a marketing ploy used to grab customers' attention. Supply issues with products that are already on the market may prompt resellers to increase their asking prices, but this is unrelated to what makes collectibles valuable in the first place.

Insurance for antiques and collectibles

Owners of collectibles ought to think about getting collectibles insurance. These insurance plans provide coverage for unforeseen damage, including flood, theft, and accidental breakage. Even though this type of insurance is required for priceless items, your collection does not need to be worth millions of dollars to be worthwhile.

Many insurance providers include collectibles coverage in existing homeowner's policy. The cost of collections insurance varies depending on the value of your collection, but it is often reasonable.

Antiques vs. Collectibles

Sometimes, the terms "antique" and "collectible" are used synonymously. It's

important to remember that the two cannot be used interchangeably. All collectibles are antiques, yet not all collectibles are antiques since valuable items do not have to be old.

The reasons people buy antiques is because of their age. Antiques include things like furniture, paintings, trinkets, jewelry, and other items.

Some antiques are very expensive. Rare, genuine antiques that are in high demand might be pricey. Other antiques, on the other hand, might merely have sentimental value. For instance, a piece of furniture that has been passed down through a family may be valuable for sentimental rather than financial reasons.

Benefits and drawbacks of collectible investing

The benefits and drawbacks of collectible investing are:

- Investing in collectibles offers the finest opportunity to purchase items that inspire you.
- People are more inclined to collect things as a hobby than to make money, whether it be sports memorabilia, antiques, comic books, fine art, or model trains.
- However, adding collectibles as an asset class may make sense for investors looking for greater diversification. Collectibles can increase in value even when you don't expect them to.
- On the other side, investing in collectibles carries a lot of risks. Because collectibles don't produce dividend income, markets can rise and fall quickly depending on the buyer's perspective.
- Collectibles have problems such as high transaction costs such as gas fees, handling, storage costs, and a lack of liquidity. Finally, counterfeiting is a severe problem in all fields of collecting. *Figure 3.4* shows antiques and collectibles:

Figure 3.4: *Antiques vs. Collectibles*

Collectibles examples

Genuine collectibles, like trading cards and stamps, have skyrocketed in price. One of the most expensive collections in the world is the T206 Honus Wagner baseball card, which was released by the American Tobacco Company in 1909. Nearly every time, Honus Wagner cards sell for more than $1 million. In May 2021, the card brought in a record-breaking $3.7 million at auction. For a card that was given away with cigarette packs, it's quite a haul.

Another illustration is Treskilling Yellow. A 2010 Swedish postal stamp that was incorrectly produced sold for almost $2.3 million.

Popular culture figures frequently become collectibles with a rising value. Alongside stamps and baseball cards, rare comic books featuring Spiderman, the Hulk, and the Fantastic Four have joined the ranks of collectibles that are now worth more. You or your estate may become wealthy because it's difficult to predict when the next million-dollar collection will come in but don't depend on it to support your retirement. You are free to keep the things

you value, though.

A notable example of a mass-produced item being sold to a collector is the 1990s Beanie Baby mania. Ty, the manufacturer of the item, created a large number of tiny plush toys with a floppy, bean bag-like texture. They captivated consumers because they thought they may one day be valuable. Limited editions that were difficult to get were valued during the time they were available due to resellers purchasing the replenished supply. On the other hand, because they were so popular, most plush toys never attained value and ended up as garage sale artefacts, although a small number did start to appeal to collectors.

Selling collectibles

Nowadays, it's simpler to sell collectibles because of online markets. Etsy, Craigslist, Facebook Marketplace, Bonanza, Ruby Lane, ArtFire, and eBay are just a few of the places you can sell your goods. Even the titan of e-commerce Amazon has a thriving collectibles industry.

Local swap meets, flea markets, and antique shops offer the chance to sell your goods face-to-face.

Problem with traditional art, collectibles and memorabilia

Collectibles are an alternative investment because they are not stocks, bonds, real estate, or cash. Some investors dive headfirst into the collections industry, believing they can make a fortune in a field plagued with fraud, con artists, and scams.

Understanding the market is necessary to identify these risks. Although buying and selling collectibles can be profitable, few individuals actually do. If you believe you are capable of detecting these dangers and locating deals that can be sold for a profit later, go for it; although, keep in mind that investing in collectibles includes a lot of negatives.

Consequences of investing in art and collectibles

The consequences of investing in art and collectibles are as follows:

- Fees and Charges
    - People frequently tell tales of finding something in the attic, buying it for a few dollars at a garage sale, and then selling it for a fortune. This does happen, but it's improbable that it will happen to you. You must make costly purchases if you really want to profit

from collecting.

- Because collectibles have a lot of dangers that other sorts of investments do not, they are a more complex investment to understand than other types of investments.
- Major risks associated with collecting include expensive costs and fees, a lack of investment income or dividends until the sale, the prevalence of counterfeits, and a higher-than-average chance of asset destruction.
- It is a prevalent misperception that the performance of larger financial markets has no bearing on collectibles; in reality, the stronger and wider the market, the better the collecting markets.
- They will enjoy it if you plan to retain such things for a long time, but "probably likely" does not imply that you will. It's still possible to spend a lot of money without ever getting your money back.
- If you have to pay for handling, storage, marketing, and insurance, you'll also be spending a lot of money. In many cases, you'll also be responsible for paying for upkeep and repairs.
- You'll probably have to lose money first if you're serious about learning the skill of collecting and selling collectibles. Trial and error are the best teachers, and experience is the best instructor.

- Tax liabilities and a lack of earnings or dividends

  In India, the capital gains tax on the sale of a collection that has appreciated in value is a whopping 28 percent. You must pay normal income taxes on a collectible if you sell it in less than a year.

  Unlike other types of investments, you won't get paid if you invest in collectibles. Up until the item is financially sold, you won't get anything.

- Lack of information and difficult comps

  Although the information on collections is still available, compared to trading anything on the open market, the amount of information you can learn about a collection is limited.

  It's important to examine similar antiques, but just because one was appraised at $5,000 doesn't mean yours will be given the same assessment. A lot will depend on how the collectable is in condition.

- Counterfeits, illiquidity, and the threat of destruction

  Collectibles may be difficult to sell since it is frequently difficult to find a buyer. False goods abound in the collectibles market. Take all essential safety measures to stay out of this bind.

  The value of your belongings may be zero if your home is damaged by fire or flood. A collection could be lost as a result of a number of additional circumstances. Make the required arrangements.

- Performance of the Stock Market

  It's good knowledge that the performance of the stock market has no bearing on collectibles. This is true to some extent, but not entirely. When the stock market is doing well, investors have more cash on hand, which encourages them to buy more collectibles.

  When the stock market crashes, investors have less discretionary cash, which has a detrimental impact on the collectibles market.

Digital art before NFTs

Although the phrase "digital art" conjures up thoughts of the future and technological advancement in the present, the roots of this kind of artistic expression date back to much before the invention of the World Wide Web. One of the most historically significant instances of bringing together art and technology is the Experiments in Art and Technology (EAT) initiative, which was founded in New York in 1966 as a result of a partnership between the creators of John Cage's statue and a group of engineers from Bell Laboratories, a US technology research and development center.

Computer art is a product of the collision between digital art and computers between the 1960s and 1970s. Both Benjamin Francis Laposky and Harold Cohen, two English artists who are now recognized as pioneers in computer graphics, made contributions by demonstrating that art can be produced using a computational tool.

Frieder Nake, a German artist and mathematician, made history at the same time by producing the first examples of computer-generated artworks. At a time when computers did not yet have screens, Nake decided to create a series of drawings on paper using a ZUSE Graphomat Z64, a precision drawing device run by the program "Walk-Through-Raster." Recognizing the potential of new technology for the creation of graphics before computers had

a screen created especially for this function was a ground-breaking feature of the work.

In the 1980s, when every computer came with a screen, digital art was given a new direction: Pixel Art. The ability to create images from pixels has improved over time, reaching contemporary forms like NFT.

One thing is for sure: discussing digital art nowadays means examining a broad topic that includes the use of different media and the production of varied auditory, audiovisual, and experiential content.

When the Internet meets digital art

The art industry made its first step toward integrating with this new reality in 1995 when anyone with a computer and a phone line could access the Internet. Net Art was developed. Software, browsers, and code were combined with the creations of the most avant-garde artists in the bulk of Net Art pieces, which were merely websites meant to serve as virtual expressive spaces by the artists.

The Net Art movement is best known for introducing new themes to the world of artistic production, including the development of a truly democratic and free virtual space, the influence of coding on textual production and cultural generative processes, new techniques for archiving historical reality, and the existence of an Internet aesthetic.

In the 1990s, major Western museums like the MET and the Withney Museum began to take an interest in Net Art due to its potential for innovation. However, the majority of Net Art projects were open-source, which made them inappropriate for the collecting world due to their strong tendency toward the free usage of works.

The inability to make digital art made and distributed in the Internet era unreproducible or inaccessible to people who do not have property rights as a result emerged as one of the most serious concerns.

Art that pushes boundaries

Digital art is distinct in that it develops in labs and on programmers', engineers', and mathematicians' workstations rather than in creative environments. As a result, it has not always followed the path of the

conventional art market; nonetheless, this distinction is what makes this movement unique and enables it to go beyond the bounds of the art idea.

Today, a wide variety of artistic mediums, including sound, picture, video, and a mix of all three, are referred to as "digital art." Modern artists frequently play with the link between viewers and digital work as well as the interaction between digital work and reality. One of their favorite topics to explore is the line separating virtual reality from physical reality. One can wonder whether the advent of blockchain technology will be able to open up a market of collectors for digital art that it could never have had previously - partially by choice, partially by condemnation.

Advantages of NFTs

The most recent industry buzzword in the blockchain space is "non-fungible tokens" (NFTs). They have shown to be entertaining side projects in the cryptocurrency space. You might be wondering how useful they are given the hype around them. either as a buyer, a seller, or a prospective investment.

The benefits of NFTs are as follows:

- Decentralized marketplace

  Through NFTs, artists can make a direct profit from their creations. A great example is art, which needs a representative to market and sell the piece. NFTs eliminate the intermediaries, enabling artists, and original producers to interact and transact with their clientele directly. Since they might be paid every time the NFT is transferred, the innovators stand to make much more from this arrangement.

- Unique

  Because they can only exist once and are challenging to recreate, NFTs are special. Instead of thousands of NFTs, an artist or a seller will only have a few hundred. It makes sense to assume that you will be one of the few people who have these valuables as a result.

- Collectibles

  Technically, every NFT is collectible. They are unique, as was previously said, and there might only be one of them. When you buy them, you can keep them and their value will increase over time.

- Re sellable

A majority of people will participate in NFTs in order to earn money. For many people, reselling them is a successful business. Large returns can be obtained by investing in NFTs for resale value. Even though the first buyer only paid a few thousand dollars, several of these antiques have been resold for more than 30,000 USD. By reselling, they made about $25,000 USD in only one transaction!

- Immutable

  The data on the token cannot ever be changed. Additionally, it cannot be lost, destroyed, or taken out of the blockchain. Due to the fact that their data will never change, they are built to last forever. They are valued and collectible due to this alone.

- Copyright

  One of the most important advantages of NFT technology is that it allows creators of original content to retain all their copyright. This is not the case in the majority of license agreements. By doing this, they can continue to profit without giving up their copyrights.

- Security

  You can feel safe using NFTs because they are secure. As a result of blockchains' decentralized nature, their data is dispersed among numerous nodes around the world. There is always the same database record at each node. There will always be a record of it, even if the network is offline.

Nodes will always be functioning thanks to NFT technology, regardless of what happens to the blockchain. As a result, the information cannot actually be changed. This is a result of both the money they protect and the money they produce.

Numerous advantages of the NFT blockchain technology make it incredibly profitable. They are advantageous to both producers and resellers in addition to the former. It is obvious that NFTs have a great deal of potential to play a crucial role in the future of most sectors.

Beginning of NFTs

Time-based media art and blockchain technology are combined by Crypto Art and NFTs to provide a pro-artist, decentralized, authentic, and limited

form of art.

Who was the first to invent the NFT?

What is the root of this technological craze? The narrative of NFTs and Kevin McCoy, the man who created them, began on May 3, 2014. He invented the non-fungible coin "Quantum" before the crypto-art market took off.

In the pixelated image of Quantum, an octagon is filled with objects that are all around a central point while hypnotically pulsing in vivid hues. Larger shapes encircle smaller ones. For $7 million, the one-of-a-kind "Quantum" art project (2014-2021) is presently up for sale.

McCoy has a unique personality. He and his wife Jennifer are well-known for being elite digital painters. According to McCoy, "the NFT phenomenon is deeply ingrained in the art sector."

It was the result of years of artistic experimentation with cutting-edge technology. McCoy would rather sell their work privately or through galleries than in open bidding wars. "Every Shot, Every Episode," one of their works, is currently on display at the Metropolitan Museum of Art.

The history of non-fungible tokens

The Crypto Art category was inspired by cultural phenomena like CryptoPunks, Rare Pepe, and CryptoKitties. These pieces of "art" become well-known as a result of viral network effects and people's willingness to pay a high price to own them. *Figure 3.5* depicts the development of non-fungible tokens:

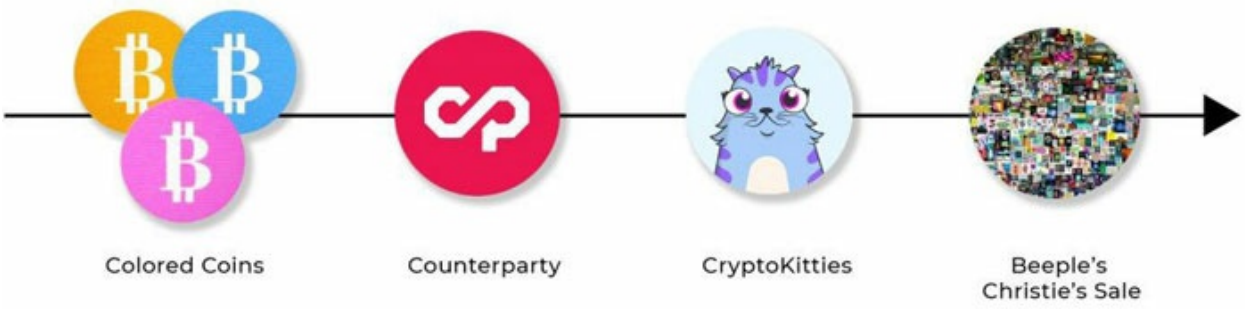

Figure 3.5: *History of non-fungible tokens*

Colored coins, 2012-2013

A "colored coin" that was first made available on the Bitcoin network in 2012–2013 served as the model for NFTs. Colored coins are tokens built on the blockchain that represent real-world assets and can be used to prove ownership of anything from shares of stock and bonds to real estate, cars, and precious metals. The original idea was to hold assets like digital collectibles, coupons, real estate, company shares, and more on the Bitcoin network. They were thought to be cutting-edge technology with unrealized potential for use in the future.

Counterparty 2014

Robert Dermody, Adam Krellenstein, and Evan Wagner developed Counterparty in 2014 as a peer-to-peer banking platform and distributed, open-source Internet protocol based on the Bitcoin blockchain. Because the Counterparty permits asset creation and has a decentralized exchange, users can create their own tradable currencies. It included a wide range of ideas and opportunities, such as exchanging memes without having to worry about fakes.

Spells of genesis on counterparty in 2015

Counterparty partnered with the Spells of Genesis creators in April 2015. The developers of the Spells of Genesis video game were among the first to use Counterparty to issue in-game assets into a blockchain, and they were also the first to launch an ICO. BitCrystals, the founders' own in-game currency, allowed them to contribute to and support Counterparty's development.

Trading cards on counterparty in 2016

August 2016 saw the emergence of new trends. To introduce their cards on the marketplace, Counterparty collaborated with the well-known trading card game Force of Will. After Pokémon, Yu-Gi-Oh, and Magic, Force of Will was the fourth most played card game in North America. They entered the ecosystem with no prior knowledge of blockchain technology or cryptocurrencies, which illustrated the advantage of putting such assets on a blockchain.

Rare pepes on counterparty in 2016

In 2016, memes made their blockchain premiere. In October 2016, memes started to appear on the Counterparty network. People started adding materials to the "Rare Pepes" craze. A popular meme called Rare Pepes has an unusual frog mascot that has grown in popularity over time. Pepe the Frog, which started out as a cartoon character, has developed into one of the most well-known internet memes. Early in 2017, as Ethereum gained popularity, Rare Pepes started to be traded there as well.

CryptoPunks in 2017

As the Rare Pepes market developed in popularity, John Watkinson and Matt Hall, the creators of Larva Labs, created distinctive characters generated on the Ethereum blockchain. No two characters would be the same, and the total amount of characters would be limited to 10,000. The project's name, CryptoPunks, alludes to a 1990s Bitcoin experiment and might be interpreted as a hybrid of ERC721 and ERC20.

ERC20, the most widely used Ethereum Token Standard, offers guidelines for how tokens can communicate with one another, but it isn't the best option for creating unique tokens. For non-fungible tokens, the Ethereum blockchain's standard was created with ERC721. ERC721 makes it possible to track the ownership and transfer of individual tokens using a single smart contract.

To start off CryptoKitties NFTs, ERC721 was used. These are virtual cats that players may adopt, breed, and sell in a game developed on the Ethereum blockchain. They were incredibly well-known and frequently appeared on prestigious news networks like CNBC and Fox News. CryptoKitties was created by Vancouver-based company Axiom Zen, and due to its quick growth, it attracted funding from illustrious investors right away. Eventually, Axiom Zen split off CryptoKitties under the new name Dapper Labs.

The NFT explosion, 2018-2021

Before exploding into widespread use in the early part of 2021, NFTs progressively garnered popular recognition between 2018 and 2021.

The supposedly obscure movement that swept the cryptocurrency industry has progressively transformed into more well-known art. Valentine's Day 2018, a turning point in the change, saw artist Kevin Abosch team up with

GIFTO for a charitable auction. The partnership led to the sale of The Forever Rose, a magnificent work of CryptoArt, for $1 million.

With the introduction of the "IAMA Coin" concept, which coupled his blood with the Ethereum network, Mr Abosch raised the stakes even more. Not just Abosch but other artists have embraced this intriguing form of expression. It's gaining popularity among artists who want to push the boundaries of their imagination.

In comparison to conventional asset transfer methods, the NFT market is more effective and liquid. A number of sites have appeared online; each with special benefits for creators and collectors. The main area of disruption is focused on reducing centralized fees, which for conventional art dealers and auction houses may be as high as 40%. The largest market for works of art, music, domain names, collectibles, and trading cards is the open sea.

The platform at Mintable is made to simplify the minting process for artists as much as possible. According to the section, it acts as a forum for NFTs, DeFi, and DAOs to communicate with the community in charge of the governance token $PRT.

The first NFT

An artist, graphic designer, and animator named Mike Winkelmann set out in 2007 to create something artistic each day for 5,000 days.

The third most expensive work by a living artist; it was the first NFT of a piece of art to be auctioned at Christie's and sold for $69 million on March 11th, 2021.

Andy Warhol presents pop art

Both spectators and critics perceive Andy Warhol as a pivotal character in the American Pop art movement. Warhol fundamentally altered the art world and its relationship to consumerism through his depictions of commercial objects and celebrities, which were influenced by materialism and mass media. From Campbell's Soup Cans (1962) to The Marylin Diptych (1962), Warhol created timeless silk-screen prints, paintings, and even sculptures.

As Andrew Warhol, the son of immigrants from Austria-Hungary, Andy Warhol was raised in Pittsburgh, Pennsylvania. Throughout his youth, when

he was occasionally bedridden due to the neurological condition Sydenham's chorea and entertained himself with movies and radio broadcasts, Warhol's love of the arts and pop culture flourished. Warhol continued his education at Carnegie Mellon University, where he pursued a career in advertising and illustration.

At this time, Warhol started experimenting with silk-screen printing, a method that has become synonymous with his work. He developed a distinct, commercially conscious style in the 1960s with Campbell's Soup Cans (1962) at the Ferus Gallery in Los Angeles. These banal depictions of daily products startled and upset a lot of people. Given the American Abstract Expressionist movement that preceded Pop art, a style of art whose theory was focused on the artists' pure, individual psyches, this was not shocking.

By introducing our culture's post-World War II fascination with fame, riches, and consumerism to the art world, Warhol was a visual pioneer in this sense. By focusing on well-known American objects and symbols of consumer culture in the United States, such as Elizabeth Taylor and Coca-Cola bottles, Warhol merged the lines between popular culture and high art. *Figure 3.6* shows Andy Warhol’s pop art:

Figure 3.6: *Andy Warhol presents pop art*

During his lifetime, Warhol received both praise and scorn in equal measure, with many critics pointing out that his overarching goal was to solidify his star status within the New York art scene. By serving as the location for some of the most opulent parties in the city, Warhol's studio, The Factory, contributed to this fame and notoriety. The Factory was a venue for artistic and social and it represented countercultural aesthetics.

Warhol tragically passed away in February 1987, at the age of 58, following a

gallbladder surgery. His financial and critical successes, including the $105 million in sales for Silver Car Crash (Double Disaster) in 1963 and the $81.9 million in sales for Triple Elvis in 1963, solidified his place as a prominent figure in American and world pop art.

Beeple’s cyberpunk worlds meet NFTs

Digital collage Beeple's Every day, which fetched $69 million at Christie's auction. The $532 million NFT that was auctioned in October 2021 is another example.

As is frequently the case with NFTs and Bitcoin, it is difficult.

The NFT in question is a CryptoPunk; one of 10,000 NFTs that were among the very first to be created. Given that they are from the initial NFT collection, these are pricey. While most sell for between $350,000 and $500,000, others go for millions.

The person behind this transaction, however, bought the CryptoPunks from themself. Like Bitcoin, NFTs are kept in digital wallets. Wallets can be created indefinitely by a single user. This person transferred the NFT from Wallet A to Wallet B. The NFT was then purchased from Wallet B by Wallet C for $532 million and immediately sent back to Wallet A.

Utilizing three wallets to sell it from one to the other

The buyer obtains a "flash loan" from third parties rather than paying for the transaction with his own funds. Flash loans are a complex decentralized financial instrument with the goal of enabling large-scale bitcoin borrowing, provided that all smart contract requirements are met. Only if you already had a buyer in mind who was prepared to pay enough for you to make a profit and pay the lenders' interest should you think about borrowing money to buy a $1 million home. The only difference was that this individual did both the buying and the selling.

On Twitter and Discord, the two platforms where most NFT debate occurs, the sale was quickly discovered and speculated about. The general consensus is that it was a PR gimmick intended to boost the owner's CryptoPunks' price.

There are two groups of art NFTs. A one-of-a-kind is a style in which an artist creates a piece of digital art and sells it, much like how real-world art

sales operate. The NFT collections, like CryptoPunks, present an additional choice. This is when designers and artists create a huge number of NFTs (usually 10,000) using the same template but with different characteristics. 10,000 apes, for instance, can be found in the Bored Ape Yacht Club, which also features different sceneries, costumes, and facial expressions. Like Pokémon cards, the NFT gets more expensive as the traits get rarer. The "floor" price for Bored Apes is $190,000, while extremely rare ones can sell for millions of dollars. (101 items at a recent sale brought $24 million.)

Since it made its debut in 2017, when most of the world was just getting started with Bitcoin, CryptoPunks is recognized as the first NFT collection. The highest legitimate sale made by a Crypton was $11.7 million.

History of digital art

Digital art is any artwork produced or presented via the use of digital technology.

The term "digital art" was first used in the early 1980s when Harold Cohen, a pioneering digital artist, started using paint software made by computer programmers. A robot named Aaron was created with the intention of producing large artwork on paper that was spread out on the ground. Since making this early foray into artificial intelligence, Cohen has improved the AARON algorithm as technology has developed.

Digital art can be generated, scanned, or sketched using a tablet and a mouse. In the 1990s, downloading video to computers was made possible by advances in digital technology, enabling artists to edit the images they had taken using a video camera. Artists could now cut and paste images within moving movies to make visual collages, something they had never been able to do with cinema before.

Digital art: a real art

On the subject of whether digital art qualifies as genuine art, there has been much debate and divergent opinions. Is the final product created with "real," true physical products and tools? So, the response is no.

Digital art, on the other hand, might be regarded as genuine art because it calls for many of the same creative methods and abilities as traditional art. No matter the medium used, the underlying goal of all art is to express the

emotions of the creator.

The same skills, talents, creativity, knowledge, and effort are needed to produce high-quality digital art as they are for traditional art. Every artist needs to develop their tool mastery, regardless of the medium. Digital art can therefore be considered "real" art.

Purpose of digital art

Although there are many uses and applications for digital art, businesses are where it is most frequently used. This entails creating visual graphics and animations for use in movies, video games, and other forms of media.

Numerous new professions and industries have emerged for digital artists around the world as a result of how simple it is to make, distribute, and sell digital art. Digital art can also be used to produce graphic designs.

High-end collectors are getting more and more access to digital art. Because of crypto art, many digital artists have been able to sell their creations for prices that were previously reserved for traditional artworks.

Advantages and disadvantages of digital art

The use of digital art has both benefits and drawbacks. One benefit of digital art is that it is much more practical than traditional art because it requires much less setup and does not require a collection of tools like brushes, paints, and other materials. Compared to traditional art, it is also a lot more forgiving because most mistakes can be corrected with just one mouse click.

Because digital art is saved, it is also simpler to maintain and offer than traditional art. Artists can quickly and conveniently submit their works digitally with a few mouse clicks if the need arises. This method has made digital art more widely available and impactful.

The lack of emotional resonance, tactile quality, and sensory experience of using pencils or brushes on paper is one drawback of digital art.

The advantages and disadvantages of digital are:

- Creating digital art

  The software and technology used to make digital art can be used in many different ways. To get started, you'll require the following

supplies for digital art:

A drawing tablet with a pen, software like Photoshop and Illustrator, a computer or laptop to execute the program, and imagination and creativity are all required.

- Challenge to create digital art

  Because of the steep learning curve associated with changing to a new medium and comprehending all the complexities of the multiple tools required, traditional artists, especially beginners, may find it difficult to make the move to digital forms. The only real difference between it and traditional art is that it requires a little longer to get acclimated to and develop your skills.

- Drawing is easier than digital art

  Digital art can be simpler than drawing because it allows the easy erasure of errors. With a variety of tools and settings at their disposal, digital media also makes it easier and more practical for artists to use methods like coloring, layering, shading, and others. On the other side, more experienced artists could struggle to learn the new tools required to create digital artwork.

- Digital art is easy for beginners

  Not nearly, since digital art still requires the same fundamental creative skills and tool proficiency as conventional art. However, because it is much simpler to start without needing a lot of settings, space, or painting supplies, it is more forgiving and enticing to beginners.

- Digital art is more popular

  You might be more familiar with digital art as a result of your online presence, but it's hard to tell whether it's really more well-liked. The online popularity of digital art may be due to the fact that it is simpler to share and publish than conventional art. The ease of digital art appeals to many beginners as well.

  Many famous exhibitions that are now on view throughout the globe combine elements of conventional and digital art. For instance, Yayoi Kusama's work, which merges digital and physical art elements, consistently draws record crowds. The digitization of earlier conventional artworks by painters like Vincent Van Goh for recent digital "immersive" exhibitions has opened up these works to a larger

audience and made them previously inaccessible.

- Creating a collection of digital artworks

  There are numerous ways to buy and collect digital art. A great approach to discovering and buying digital art is through the developing subculture of crypto art. Like traditional original artworks, digital art may make an excellent investment choice if you value the work of crypto or digital artists.

CryptoKitty

If you're familiar with Pokémon cards, CryptoKitties is a digital version that gained popularity right away after it was released. Axiom Zen, a design firm with offices in San Francisco and Vancouver, developed a game in 2017 that uses the Ethereum blockchain and lets players breed, trade, and buy virtual cats. Just a few weeks after its launch, CryptoKitties surprised the tech sector by becoming a worldwide hit. So, in its first few days, CryptoKitties made $1.3 million. And by 2021, they've already crossed $1.2 million. *Figure 3.7* shows CryptoKitties:

Figure 3.7: *CryptoKitties*

One of the most well-known and widely reported NFT (Non-Fungible Token) technologies was CryptoKitties. Although it started out as a tool for

educating new users about blockchain technology, it quickly gained traction among players of well-known trading card games. At its height, CryptoKitties attracted over 14,000 active players per day. Additionally, the game pushed Ethereum blockchain technology among the biggest names in the gaming business.

A special NFT called CryptoKitties uses the ERC-721 token standard as the foundation for its coding scheme, enabling the existence of "genes." The majority of the kittens' physical characteristics were determined by these genes, which were commonly passed down to their offspring through "breeding."

Now accessible across the Ethereum ecosystem, CryptoKitties. Examples of Ethereum-based software include Heaven.cat, Decentraland, and KotoWars. To pay the trading and fee expenses, all you need is an Internet browser (such as Chrome or Firefox), a cryptocurrency wallet (such as MetaMask or Dapper), and Ether (ETH).

Working of CryptoKitties

All CryptoKitty tokens are non-fungible. It is also known as an ERC-721 token. As a result, CryptoKitties are singular and indivisible, similar to non-fungible tokens. The kittens are currently exclusively available on the Ethereum blockchain, demonstrating their rarity. Their underlying code, therefore, makes sure that their validity is separate. CryptoKitties are tracked by Ethereum using smart contracts. They also record who owns them and how they are dispersed. Additionally, they permit the sale and breeding of kittens and keep track of the Kitty DNA.

The basic contract for CryptoKitties also keeps track of ownership changes and authorized siring. Smart contracts conduct each auction held for breeding, selling, and buying at the cost of a transaction fee. The Ethereum blockchain is where the CryptoKitties coins are now immortal, which means they will still be usable and transferable even if the CryptoKitties website is shut down (which is, of course, highly unlikely.)

Blockchain technology became more well-known because of CryptoKitties, which also improved the Ethereum blockchain in particular. When it was released in 2017, the game was a huge success. However, due to CryptoKitties' extreme popularity and the massive volume of transactions it

generated, the Ethereum network was congested for a few days. Nevertheless, this challenge exposed novel approaches to managing Ethereum transactions and motivated scaling solutions that today form the basis of blockchain ecosystems and drive their expansion.

Things to know before buying CryptoKitty

You must first establish a bitcoin wallet before proceeding. Daffer and MetaMask are fantastic options. Visit the CryptoKitties marketplace to look for kittens to purchase after setting up your wallet. Name, bio, and price are all listed for each kitten (ETH). The "cattributes," or distinctive genetic traits of the kittens, are also noted. These traits include the eye colour, shape, and occasionally hair. This affects how they seem. The generation and the year of birth are both included in the catalogue.

Typically, first-generation kittens are more expensive. The first 100 kittens ever born are actually the Founder Cats. They are the Gen 0 NFTs that are the most expensive. Founder Cat 87 was sold for more than $80,000 in 2017. On the other side, founder Cat 84 just sold for more than $64,000 in 2021. Then, there are the kittens that have never been in a cat-cat environment. These cats, as the name suggests, have never been crossed to generate offspring. The most expensive sale so far was $172,000 for a unique dragon cat.

Click "buy now" if you wish to purchase a kitten that you like. The present owner of the cat, however, is free to accept or reject any offer you make to him or her. Once you've come to an arrangement, you can exchange the required amount of ETH for the kitten's ownership.

Buying a Cryptokitty

Look around the market to see whether there are any Kitties. When you click on a Kitty and choose the "Buy now" option, your browser's plugin transaction window for your wallet provider (such as metamask) will open. The time it takes for your profile to appear varies. The Ethereum network is the only thing that works.

Offer

Making an offer to buy cats is an additional choice. Even if a Kitty isn't currently for sale, players can use the game's Offer system to place an ETH offer on it. After an offer has been made, the owner has the choice to accept

or reject it. There is a three-day time limit on offers.

Breeding

You can crossbreed two of your cats or use a public sire to produce a brand-new kitten. Go to your litter and choose a cat to be the sire (father) in your breeding if you want to breed two of your cats. This cat will display a "Breed" button. From the drop-down option, choose "Sire with my Kitties." The Dame (or mother) for your breeding must be chosen. Select a breeding pair, then select "OK, give them some privacy" to launch a transaction window for breeding cost as a gas fee and observe the Kitties at work.

Selling or siring

Once you have some CryptoKitties in your possession, you can sell or sire them to the general public. If you go to your litter and click on one of your Kitties, you'll see the buttons "Sell" and "Breed." You can start an auction on the website that is linked by these buttons. By using "Breed," you can create a Siring auction that will allow other players to breed with your Kitty on the Siring market. The "Sell" command starts a sale auction. Other players can find your sell auction on the market. The duration and starting and ending bid prices for the auction are up to you.

Buying a Cryptokitty

To buy a cryptokitty follow these steps:

1. Download and install MetaMask

   The simplest way for beginners to connect to the Ethereum network is through MetaMask. A digital wallet called MetaMask is used to sign contracts and transactions. It is available as a chrome extension.

2. Buy some ether

   You must first buy Ether before you can purchase a cryptokitty. Using Coinbase to make a purchase is the most practical option for US citizens. If you already have a Coinbase wallet, you can purchase directly through MetaMask, which makes use of the Coinbase widget. You can buy ether through a cryptocurrency exchange if you're not in the US.

3. Fund your MetaMask wallet with Ether

   If you've never sent Bitcoin or Ether to a digital wallet, hold onto your hat and make some notes. The way that cryptocurrency works are different from how you are used to it.

   It's referred to as a key pair. Thus, your private key and public address are each made up of a lengthy string of characters.

   Think of the address of your house and a real key as the combination to access it. Your public key is like the address to your house, which is well-known and easily searchable online. Similar to the key you use to enter your home, your private key also serves the same purpose. That key, which you keep in a safe place, is only in your possession. The same care should be taken with your private key as you would with your house key. The money linked to your public address can only be accessed with your private key.

   You will therefore copy your public key once you are in MetaMask and paste it into your Coinbase wallet. From Coinbase, you are moving Ether to your MetaMask wallet.

4. Visit **https://www.cryptokitties.co/** to register and purchase your Cryptokitty.

   Now that your MetaMask has some Ether, it's time to get your first kitty. The "sign-in" button will prompt you to log in to MetaMask rather than the crypto kittens' website when you click on it. Greetings from the new blockchain technology era!

   Figure 3.8 shows a blurry image of a Fox in the top right-hand corner:

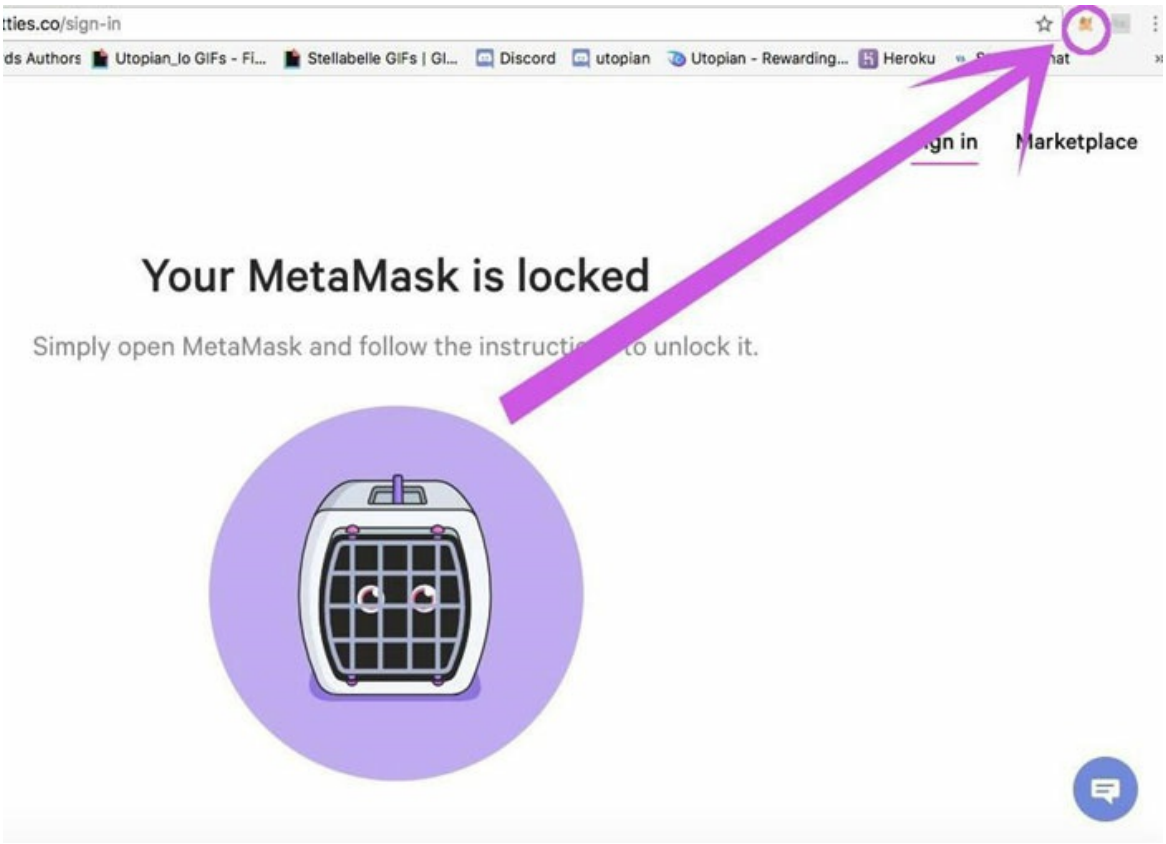

Figure 3.8: *Blurry image of a Fox in the top right-hand corner*

Make sure the Ethereum main network is connected to your device.

It's time to go to the Marketplace right now.

5. Once you've found one you like, click on the drop-down menu and choose Ok Buy This Kitty.

   The hardest part of the surgery is this. There is a cost associated with creating a transaction on the Ethereum network. To lessen spam on the network, this is done.

   The blockchain of Ethereum is being destroyed by cryptokitties!

   The most important step is to ensure that your Gas Limit is set to 250,000 because a glitch in MetaMask causes it to default to a huge absurd number. *Figure 3.9* shows how to set the gas limit:

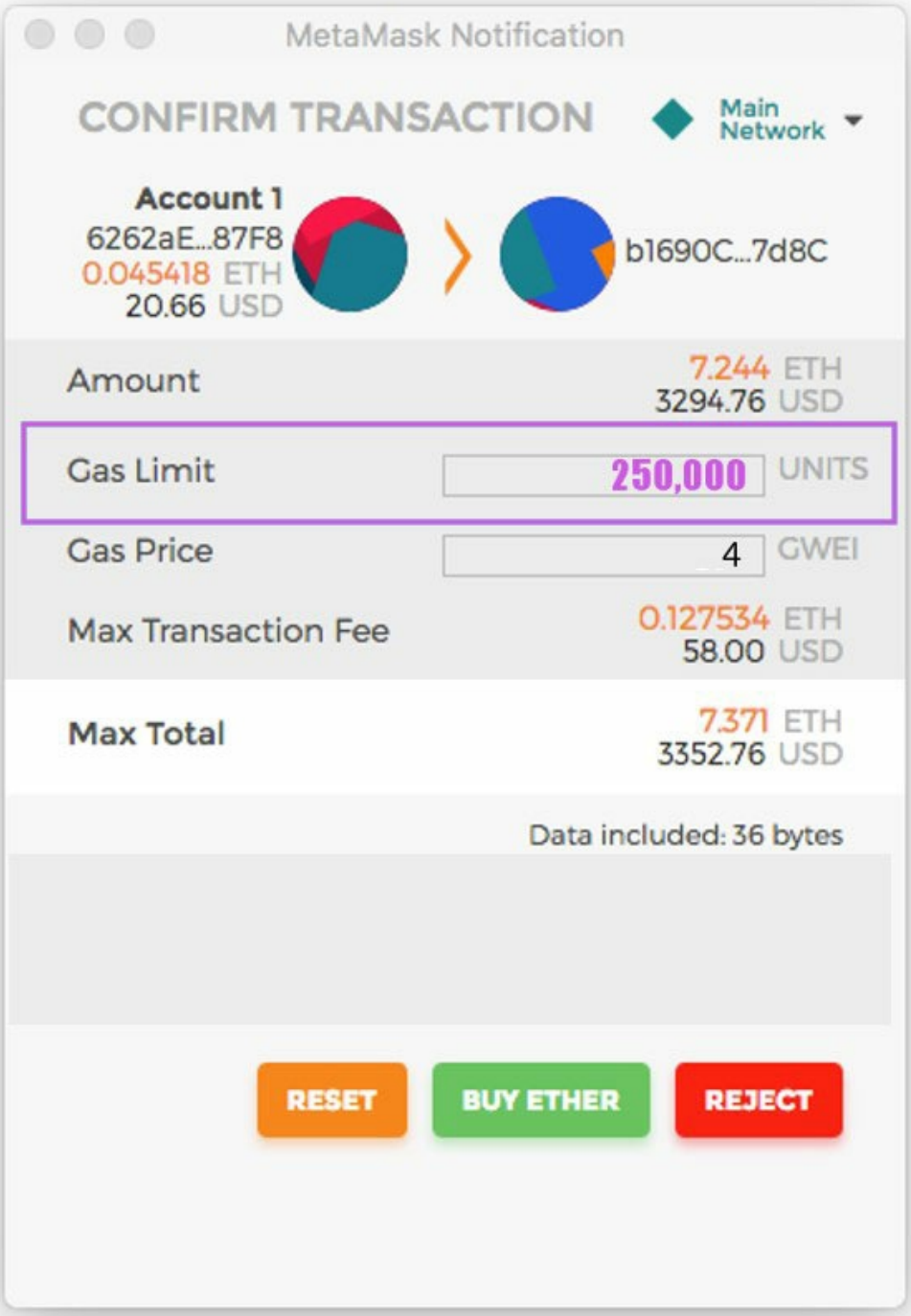

Figure 3.9: *Setting the gas limit*

6. Check your transaction. Refer to *Figure 3.10* to check the transaction:

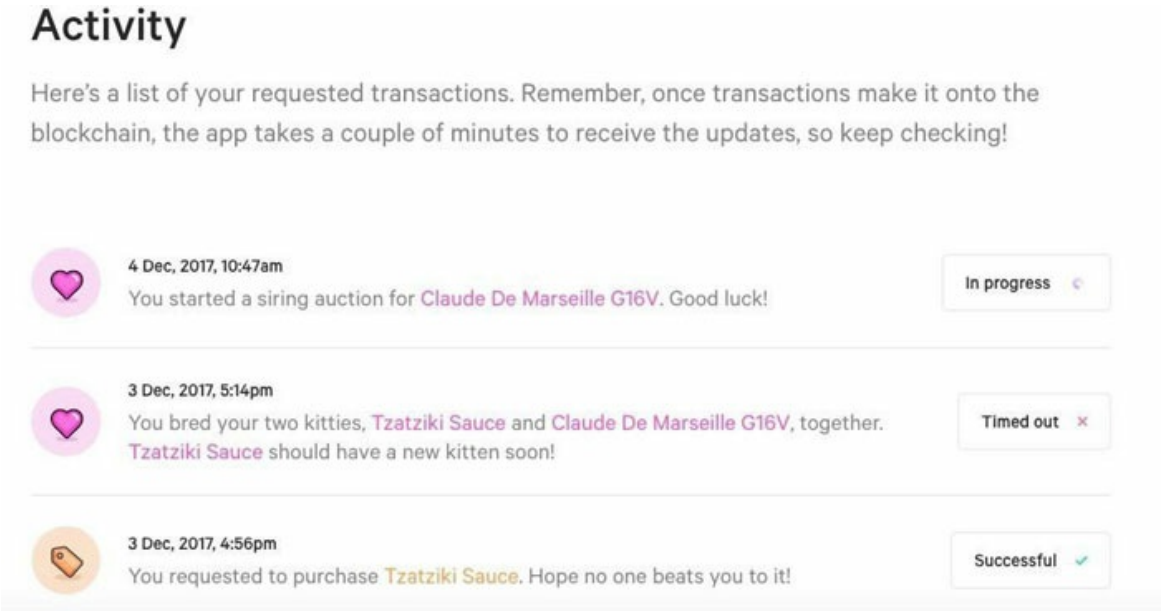
Activity
Here's a list of your requested transactions. Remember, once transactions make it onto the blockchain, the app takes a couple of minutes to receive the updates, so keep checking!
4 Dec, 2017, 10:47am
You started a siring auction for Claude De Marseille G16V. Good luck!
In progress
3 Dec, 2017, 5:14pm
You bred your two kitties, Tzatziki Sauce and Claude De Marseille G16V, together. Tzatziki Sauce should have a new kitten soon!
Timed out
3 Dec, 2017, 4:56pm
You requested to purchase Tzatziki Sauce. Hope no one beats you to it!
Successful

Figure 3.10: *To check the transaction*

The squiggly line icon in the top right-hand corner by moving your mouse over it.

You may check the status of your orders and transactions on this page. You will be here for the majority of the time with frazzled nerves.

Introduction to the wallet

A digital wallet is a piece of software, a gadget, or an online service that enables people or businesses to carry out transactions online. Along with other items like gift cards and driver's licenses, it keeps track of clients' payment information for various payment methods on numerous websites. A digital wallet is also known as an e-wallet. *Figure 3.11* shows the digital wallet logo:

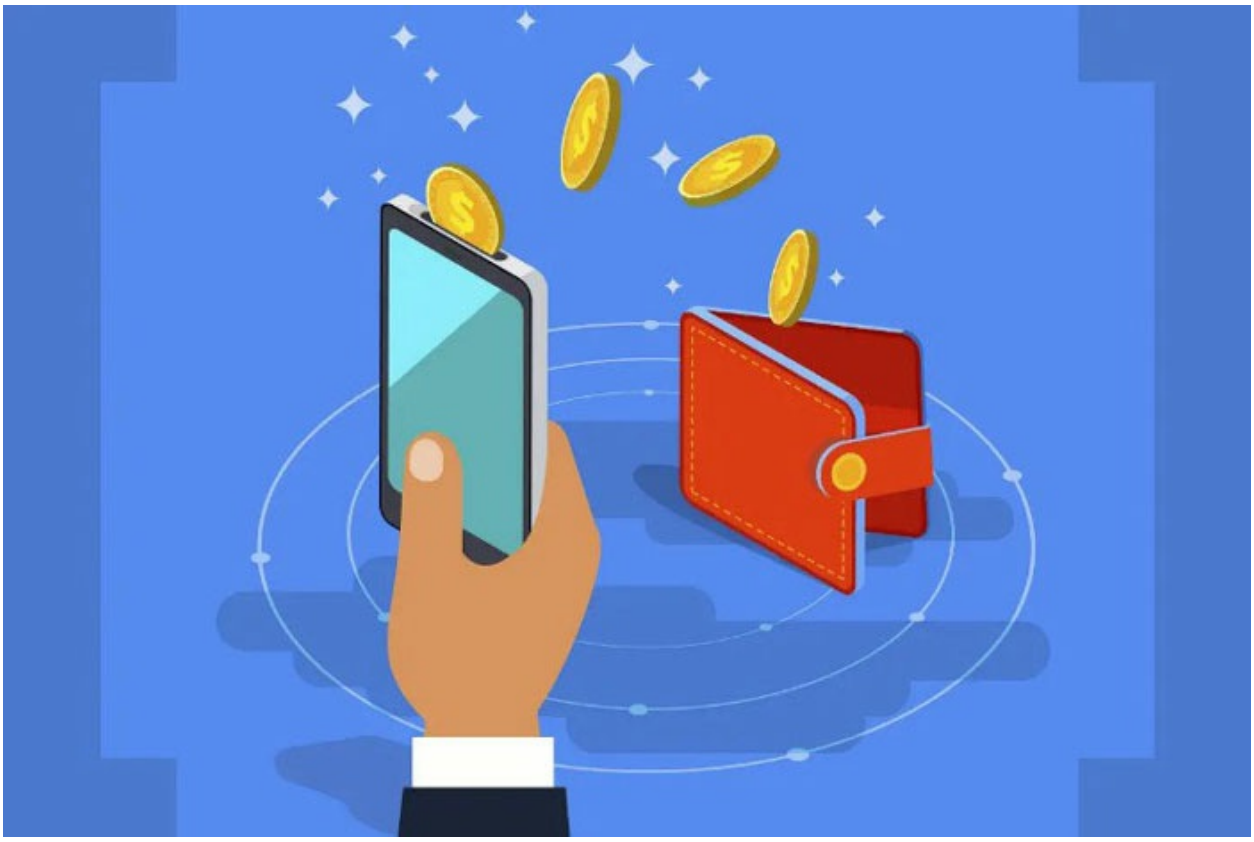

Figure 3.11: *Digital wallet*

Although it can be used on a PC, a digital wallet is commonly carried via a smartphone app. The smartphone app is the most widely used type of the digital wallet because of its portability and adaptability.

Digital wallets are convenient in some situations, but they are also more secure than physical wallets. To utilize a digital wallet, users must first download a specialized program created by a bank or a reliable third party.

Importance of a digital wallet

The importance of having a digital wallet are as follows:

- All the user's payment information is safely stored in a digital wallet. As a result, it is no longer absolutely necessary to carry physical wallets.
- Businesses that need to collect user data for marketing purposes may find that digital wallets are particularly helpful. They gain knowledge about customer purchase patterns and boost the effectiveness of their product's marketing plans. Contrarily, consumers lose their privacy as a result.

- By using digital wallets, many underdeveloped countries may increase their participation in the global financial sector.
- Using digital wallets, users can send money to friends and family who reside in different countries.
- Digital wallets also eliminate the need to open and maintain a bank account with a legitimate bank or business. They thereby connect individuals and businesses in far-off places.
- You'll need a digital wallet in order to carry out cryptocurrency transactions and maintain track of balances.

Different types of digital wallets

The three types of digital wallets are shown in *Figure 3.12*:

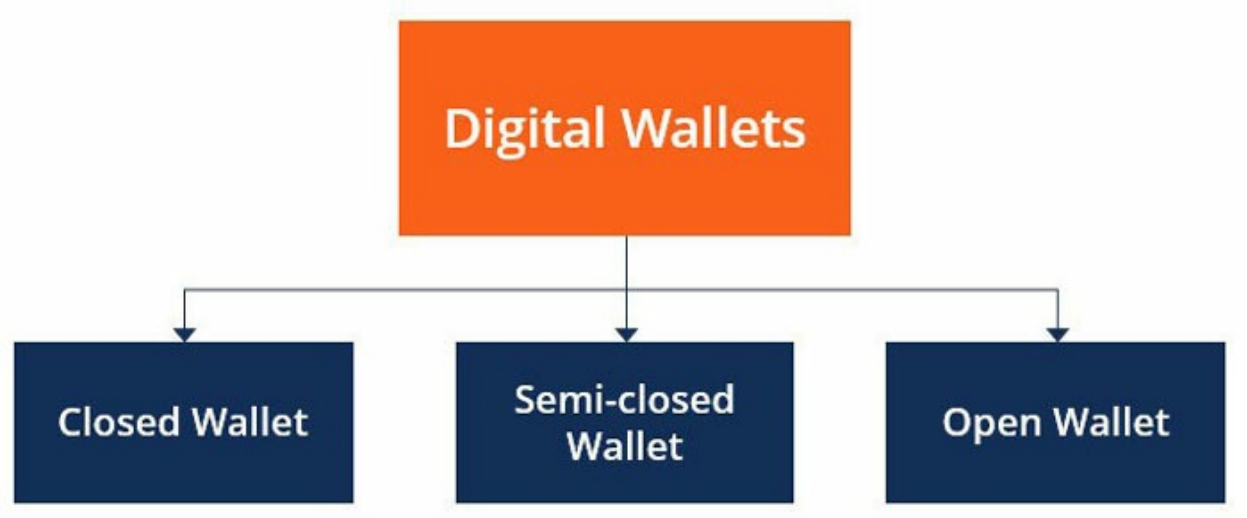

Figure 3.12: *Types of digital wallets*

Three types of digital wallets are:

- Closed wallet

  Customers of businesses that sell goods and/or services have the option of creating closed wallets. Only the wallet's issuer can conduct transactions with funds in a closed wallet. The wallets contain the money from refunds, returns, and cancellations. Amazon Pay is similar to a closed wallet.
- Semi-closed wallet

Users can make purchases at businesses and locations listed in a semi-closed wallet. Despite having a small coverage area, wallets can be used for both online and offline transactions. However, in order to accept payments with mobile wallets, merchants must enter into agreements or contracts with issuers.

- Open wallet

  Banks or organizations that have partnered with banks issue open wallets. Open wallet users can use them for any transactions that a semi-closed wallet permits, including cash withdrawals from ATMs and banks and financial transfers.

Top 5 NFT wallets

Some of the top NFT wallets are:

- Metamask

  Metamask is one of the most well-liked bitcoin wallets. With just a few clicks, users may instantly access websites like NFT markets thanks to this browser plugin. Additionally, Metamask makes it simple to create many addresses, enabling you to either keep your NFTs and Bitcoin separate or create a single address for each NFT you purchase.

  The company that created Metamask and ConsenSys created a smartphone application in 2020. The wallet's contents are flawlessly synchronised between the desktop and mobile applications. The mobile app also comes with a built-in browser for NFT marketplaces and decentralized apps (dApps).

  If you need to trade currencies to purchase an NFT, Metamask provides a built-in exchange mechanism. Additionally, you can place a limit on your gas expenses, albeit there is a danger the transaction won't go through. In the event that you need to use a different blockchain, Metamask offers alternative platforms. *Figure 3.13* shows the logo of a Metamask wallet:

Figure 3.13: *Metamask wallet*

- Math wallet

  Math Wallet is a serious rival of Metamask. The support for more than 70 different blockchains is its most significant feature. It has a desktop, mobile, and web wallet that connects to a variety of hardware wallets and syncs between devices. With Math Wallet, you can create many addresses as well.

  The built-in dApp browser in Math Wallet allows users to view NFT marketplaces. Additionally, it offers its utility token as well as a number of other services for cryptocurrency users, like staking, trading, and swapping. *Figure 3.14* shows the logo of the math wallet:

Figure 3.14: *Math wallet*

- Alpha wallet

  An open-source cryptocurrency wallet is AlphaWallet. Although it has some limitations (it only supports mobile and Ethereum), what makes it stand out is its native support for blockchain games and NFTs.

  Due to the simple user interface, beginners will find learning to be rather simple. NFTs and gaming tokens have a separate section of the wallet all to themselves. Additionally, users can add meta tags to their tokens to speed up search and filtering when browsing their collection.

AlphaWallet collaborates directly with OpenSea, CryptoKitties, Dragonereum, and ChainZ Arena, among other NFT markets and blockchain games. It provides direct access to DeFi apps like Compound as well as a built-in dApp browser, similar to others, for searching new NFT markets. *Figure 3.15* shows the logo of the AlphaWallet:

Figure 3.15: *Alpha wallet*

- Trust wallet

  Trust Wallet, a well-known mobile-only wallet, is owned by Binance. It is compatible with several different blockchains, including Ethereum, but because of its connection to Binance, it is largely focused on smart chain tokens. However, if you're interested in NFTs on the Binance smart chain, Trust Wallet might be the best option for you since it is already configured for BEP tokens.

  Like other wallets, Trust Wallet offers a dApp browser to locate NFT markets and makes it simple to purchase NFTs from within the wallet. Additionally, it features an integrated exchange facility that enables users to quickly convert currencies in order to obtain the token they need to trade for the NFTs they want to purchase. *Figure 3.16* shows the logo of the trust wallet:

Figure 3.16: *Trust wallet*

- Coinbase wallet

  Bitcoin exchange Coinbase (NASDAQ:COIN) is well-known. Additionally, a non-custodial wallet is available for storing NFTs and other tokens. Users who save their money in the Coinbase Wallet have total control over their money, unlike those who possess cryptocurrency on Coinbase's exchange.

  Coinbase introduced a browser plugin in 2021 that allows users to access their wallets on many devices to purchase NFTs and use other apps. Users can access dApps by using the built-in browser of the mobile wallet. Figure 3.17 shows the logo of the Coinbase wallet:

Figure 3.17: *Coinbase wallet*

The ease with which tokens can be transferred to others using usernames rather than public wallet addresses is one distinctive aspect of Coinbase Wallet. It can give transactions a more personal touch and give you confidence that the money is going to the right person.

Additionally, you may back up your private keys to the cloud with one click through Coinbase. By doing this, you may help ensure that you maintain access to your NFTs and other wallet funds.

Benefits of using an NFT wallet

A physical wallet and an NFT wallet are not the same things. You don't keep NFTs or cryptocurrencies in your wallet.

Users can instead access the assets that are kept on the blockchain thanks to this. It does this by sending a private key to that address, enabling the wallet owner to approve transactions. If you possess the private key, you essentially own everything at that address.

A wallet will take care of all the technical details and provide a simple user interface so that you may buy, sell, and transfer NFTs or cryptocurrencies. Additionally, it can offer two-factor authentication for added security and a simple way to track your assets across devices.

Things to consider when looking for the finest NFT wallet

These are the most important factors to take into account while choosing an NFT wallet:

- Accordance with the NFT marketplaces from which you plan to buy. If it isn't supported, you won't be able to purchase the NFTs you want. As a result, it is prohibited.
- **High levels of security:** NFTs might be worth thousands or even millions of dollars. You want something that is as secure as possible.
- **A user interface that is easy to understand:** A strong user interface will make buying and selling NFTs simple.
- **Cross-device compatibility:** Accessing your NFTs from a desktop and a mobile device is beneficial.
- **Support for different chains:** Although Ethereum is the most well-liked platform for NFTs, there are a number of other platforms that also support them. You'll need a wallet that is compatible with as many chains as possible in order to give you easy access to as many NFTs as

is practical.

Setup a Crypto wallet

You can safely keep your cryptocurrency in a crypto wallet. Although there are many different types of cryptocurrency wallets, hosted wallets, non-custodial wallets, and hardware wallets are the most popular.

Hosted wallets

The most well-known and user-friendly bitcoin wallet is a hosted wallet. Your money is immediately sent to a hosted wallet when you buy cryptocurrency using an app like Coinbase. It is called hosted because a third party is keeping your cryptocurrency for you, just like a bank does with money in a checking or savings account. You may have heard of people "losing their USB wallet" or "dropping their keys," but with a hosted wallet, you won't have to worry about that.

The main benefit of keeping your cryptocurrencies in a hosted wallet is that even if you forget your password, you won't lose any money. You won't be able to utilize all of the cryptocurrency's capabilities if you use a hosted wallet, which is a drawback. However, this might alter if hosted wallets start to offer more features.

Steps to set up a hosted wallet

To set up a hosted wallet, follow these steps:

1. Decide on a platform that you feel at ease using. Your primary goals should be security, ease of use, and adherence to banking and governmental regulations.
2. Create a personal account. Set up a secure password and enter your personal data. It is suggested to use two-step verification, often known as 2FA, for an additional layer of security.
3. Invest in or move cryptocurrency. You can purchase cryptocurrency with a bank account or a credit card on the majority of cryptocurrency platforms and exchanges. To keep your bitcoin safe, you can transfer it to your new hosted wallet if you already have it.

Self-custody wallets

You have total control over your bitcoin when you use a self-custody wallet like Coinbase Wallet. Non-custodial wallets don't entrust the security of your bitcoin to a third party, commonly known as a "custodian." They provide the necessary software to store your crypto, but you are alone in charge of keeping track of and securing your password. If you forget or lose your password, which is sometimes referred to as a "private key" or "seed phrase," you will be unable to access your crypto. If someone else finds your private key, they will have full access to your assets.

Need for a non-custodial wallet

You have full control over the security of your coin and can participate in more complicated crypto activities like yield farming, staking, lending, borrowing, and more. On the other hand, if all you want to do is buy, sell, send, and receive cryptocurrency, a hosted wallet is the simplest option.

Steps to set up a non-custodial wallet

To set up a non-custodial wallet, follow the given steps:

1. Download a wallet application to your phone. Most people use the Coinbase Wallet.
2. Open a profile. In contrast to a hosted wallet, a non-custodial wallet does not require you to provide any personal data. Even a contact email address is absent.
3. Write down your private key. It is presented as a random 12-word sentence. It ought to be maintained in a secure location. If you misplace or forget this 12-word phrase, you won't be able to access your cryptocurrency.
4. Transmit digital money to your wallet. You will need to transfer cryptocurrency into your non-custodial wallet from somewhere else because purchasing cryptocurrency with conventional currencies (such as US dollars or Euros) isn't always possible with one.

   If you're a Coinbase customer, you can select between a hosted wallet and a self-custody wallet. The Coinbase program, which enables cryptocurrency trading and purchases, is a hosted wallet. You can also download the standalone Coinbase Wallet app to use the features of a

non-custodial wallet. Both are held by some of our clients, making it simple to buy cryptocurrency using fiat money and take part in complicated crypto activities. Setting up any wallet is free.

Hardware wallets

A hardware wallet is a tangible object that stores the private keys to your cryptocurrency offline. Most people don't use hardware wallets because of their higher cost and complexity. They do have some benefits, though, like keeping your crypto secure even if your computer is hacked. They may cost more than $100 to buy, though, and their greater security makes them more difficult to use than a software wallet.

Steps to set up a hardware wallet

To set up a hardware wallet, follow these steps:

1. Invest in the required hardware; the two most well-known names are Ledger and Trezor.
2. Install the program on your computer: To configure your wallet, you must install the software provided by the manufacturer. Download the program from the official company website, then follow the on-screen instructions to build your wallet.
3. Add bitcoin to your wallet: Just like a non-custodial wallet, a hardware wallet prevents you from buying cryptocurrency using fiat money (such as US dollars or Euros). As a result, you need to move cryptocurrency to your wallet.

Similar to how there are several ways to store money, there are many ways to store cryptocurrency (in a bank account, a safe, or under the bed). With cryptocurrency, you have the option to use a hosted wallet to keep things easy, a non-custodial wallet to have total control over your crypto, a hardware wallet to add further security, or even a variety of wallets.

Conclusion

This chapter described how the programming of cryptocurrencies like Bitcoin and Ethereum and NFT programming are related.

Both conventional currency and cryptocurrencies are "fungible," which

means they may be traded or exchanged. Due to its fungibility, cryptocurrency offers a secure method for conducting blockchain transactions.

NFTs are different from other kinds of materials. Because of their unique digital signatures, NFTs cannot replace or compare them.

Following that, we talked about the value of collectibles, the issues with traditional art, collectibles, and memorabilia, the benefits of digital art before NFTs, and how it relates to NFTs. Pop art by Andy Warhol, Beeple's cyberpunk worlds, and NFTs

The game of NFTs will be covered in the following chapter.

Key Terms

- **Digital wallet:** A piece of software, a gadget, or an online service that enables people or businesses to carry out transactions online.
- **Collectibles:** Items like coins, comic books, toys, stamps, and antiques; which are carefully gathered and stored by their owners in safe locations over the course of a lifetime.
- **Cryptokitties:** A special NFT which uses the ERC-721 token standard as the foundation for its coding scheme, enabling the existence of "genes."

Multiple choice questions

1. **Introduction of NFTs to the bitcoin world brings:**
    a. authenticity
    b. ownership
    c. unparalleled market efficiency
    d. All of the above
2. **_____ means NFT can only exist once and are challenging to recreate.**
    a. Unique
    b. Collectibles

c. Re-sellable
d. Immutable

3. **A special NFT called CryptoKitties uses the _____token standard.**
    a. ERC-719
    b. ERC-720
    c. ERC-721
    d. ERC-722
4. **Customers of businesses that sell goods and/or services have the option of creating _____ wallets.**
    a. Closed
    b. Semi-closed wallet
    c. Open wallet
    d. All of the above
5. **An open-source cryptocurrency wallet is:**
    a. Alp**haWallet**
    b. Trust wallet
    c. Coinbase wallet
    d. d. Metamask

Answers

1. **d**
2. **a**
3. **c**
4. **a**
5. **a**

Join our book's Discord space

Join the book's Discord Workspace for Latest updates, Offers, Tech

happenings around the world, New Release and Sessions with the Authors:
https://discord.bpbonline.com

CHAPTER 4

Understand the Game of NFTs

You studied the Evolution of NFTs, their significance, collectibles, and popular NFTs wallet in the previous chapter. A token that is non-fungible is referred to as a "Non-fungible token." The parallels between it with cryptocurrencies like Bitcoin or Ethereum end there; the programming is typically different.

Physical money and cryptocurrencies are both "fungible," which means they can be exchanged for one another. Additionally, they are both worth the same amount: one Bitcoin is always worth one Bitcoin, just as one pound is always worth one pound. Cryptocurrency provides a safe mechanism to carry out blockchain transactions due to its fungibility.

Unlike other materials, NFTs are unique. Each one has a digital signature that makes it impossible to exchange or compare NFTs with one another (hence, non-fungible).

You will learn about the NFTs in this chapter. **Non-fungible tokens** (**NFTs**) have demonstrated their power to revolutionize the gaming industry ever since their creation. The advent of NFTs marks the beginning of a brand-new, exhilarating era in which players play ever-more significant roles in the gaming economy and are rewarded accordingly.

As blockchain technology is gradually embraced by game developers to make their games even more interesting, this gaming paradigm is already beginning to take shape.

In this chapter, we'll examine some of the top NFT games currently on the market. Let's go over the fundamentals of an NFT-based game first, though, before we provide our selection of the best NFT games.

Structure

In this chapter, we will cover the following topics:

- NFTs games
- NFT popular games
- MetaMask
- Risk of MetaMask
- Install, use, and secure your MetaMask wallet
- Usage of Seed phrase to backup and restore the wallet

Objectives

After studying this chapter, you should be able to know the in and out of buying NFTs, understand the Metamask and its associated risk and in the need of buying ether for Metamask wallet.

NFTs games

NFTs are one-of-a-kind digital collectibles that exist on the blockchain. They are ideal for use as characters, consumables, and other tradeable goods in video games because of this feature.

NFT games have become increasingly well-liked as a means of earning money in the game-fi industry. You can use play-to-earn models to earn tokens or sell your NFTs to other players and collectors in-game.

Ensure that you transfer your gaming NFTs to a wallet that does so. Watch out for common scams while sending NFT to an NFT marketplace or another user. To determine whether there is a chance of losing, carefully review the regulations of every NFT game you play.

Ethereum and the Binance Smart Chain are where you can find the majority of NFT games (BSC). Others use collectible cards like Sorare, while some use collectible figures like CryptoBlades and Axie Infinity.

NFT Mystery Boxes, which allow users to own NFTs of varying rarities, are another product sold by Binance. The Collections that contain NFT games include these Boxes.

NFT games have developed since their inception with the CryptoKitties craze, and they have started to provide play-to-earn models. Game-Fi, as it has come to be known, mixes the worlds of gaming with finance, enabling players to earn money as they play. You do not need to rely on chance to

acquire, find, or breed a priceless uncommon object. Players may test out a range of game models with varied themes in addition to collecting animals.

Working of NFT games

NFT games differ from merely having cryptocurrency trinkets in your wallet. In an NFT game, NFTs will be used in the rules, processes, and player interactions. An NFT might be used, for instance, in a game to represent your individual avatar or character. NFTs can also be discovered in digital items obtained through game play. After that, you can sell or exchange your NFTs for cash with other players. You can also profit from NFT games by utilizing a more recent play-to-earn model.

The rules for the NFTs used in a game to exchange, produce, and implement them are created by developers in smart contracts. Smart contracts are pieces of self-executing code that run on a blockchain.

For instance, CryptoKitties is organized around a select group of fundamental contracts. Since it controls the arbitrary mechanisms that produce new cats, their geneScience contract is the one that is most well-known. The game's code was first kept secret. Interested players even created algorithms to determine the likelihood that particular cat traits would appear. This information might help players increase their chances of breeding a desirable rare breed.

Play-to-earn NFT games

Most P2E games offer reward tokens can be exchanged for game assets within the app itself. The majority of time, when players complete a level in a game, they are rewarded with NFTs.

Tokens can be obtained frequently through gameplay, whereas NFT drops are more dependent on chance. Play-to-earn has proven to be particularly enticing to users in low-income countries as a complement to fixed income or social security.

Axie Infinity is among the most well-known play-to-earn games. To play the game, you must either obtain a free Scholarship from another player or make an initial investment of three Axies. Once you have a Starter Team and have started completing challenges and objectives, you may be able to purchase **Smooth Love Potion** (**SLP**), an ERC-20 token that can be exchanged on

exchanges.

SLP is used by breeders to produce new Axies, creating a market for the product. In the Philippines, where many players started to depend on Axie Infinity's play-to-earn strategy to make ends meet, the game gained popularity. Most players make between $200 and $1000 (USD) every month, while others can make considerably more depending on the market and their level of work.

NFTs in-game

A different way to get money while playing NFT games is through in-game NFTs. Instead of fungible ERC-20 tokens like SLP in Axie Infinity or SKILLS in CryptoBlades, you purchase NFTs, which are collectible items. Historically, NFT games have made money using this gaming strategy. Depending on an item's appearance, rarity, or use in the game, it’s worth will change.

A game that only relies on in-game NFT collectability is CryptoKitties. It would be hard to continue playing and generate steady income without the element of chance. Both play-to-earn and in-game NFTs are present in the majority of current NFT games.

Revenue model for NFT games

The mechanics of the game and consumer demand determine how much money you can make playing an NFT game. Other players who value the NFTs or cryptocurrencies you earn in the game will pay you money. To make money, you must sell your goods in a market, exchange, or auction house. In NFT games, the collectability or in-game utility of the NFT or token generates value. These two components also elicit questioning.

NFT popular games

There are many NFT games available; the majority of them are based on BSC and Ethereum. While some merely use NFTs as collectibles, others offer more traditional video game experiences.

Axie Infinity

As was already said, Axie Infinity is based on the Pokemon idea and features

creature collection and combat. The Ethereum-based cryptocurrency Axie Infinity enables users to make money by exchanging **Small Love Potions** (**SLP**), Axies, and **Axie Infinity Shards for fiat currency** (**AXS**). You may buy and trade SLP and AXS on Binance.

Sorare

A collectible and tradeable fantasy football game called Sorare uses actual soccer players. To assemble a five-player soccer team, you can utilize free cards for inexperienced players or spend money on tokenized cards. Each game you win, goal you score, or other activity you finish will grant you points toward levelling up.

Unchained gods

A tradeable NFT card game similar to Magic: The Gathering or Hearthstone, Gods Unchained is based on Ethereum. In order to compete with other players, players build decks with a variety of skills and advantages. As you advance in the game, you discover items to use or sell. You can build powerful NFT cards by using the Flux you earn by winning ranked games. In order to continue the process, you can either sell your cards for a profit or reinvest the proceeds in new cards.

NFT collections on Binance

On the Binance NFT Marketplace, NFT Mystery Boxes and Collection Partnerships provide an NFT gaming experience. These partnerships range from works by digital artists to NFT games. Each Mystery Box that is available for purchase includes a randomly selected NFT from the Collection of a unique rarity. Either you can sell it as is or you can open the box to reveal the NFT.

NFT Collections are groups of NFTs and Mystery Boxes centered around a single theme or undertaking. Up until now, game-related mystery box collections have been among the most well-liked. Check out a few instances:

The first is The MOBOX Collection. Using DeFi yield farming and NFTs, MOBOX is a BSC-based gaming platform. The Collection under the MOBOX platform offers MOMO NFTs with randomized hashing power in NFT Mystery boxes. The more hashing power the NFT has, the more valuable the MOMO becomes in MOBOX games.

The collection of Alice in My Neighborhood books. A virtual environment creation game called My Neighbor Alice uses NFT accessories. The game

assets found in the Collection's Mystery Boxes are merely cosmetic, yet customers value them and assign a value to them on the secondary market despite this.

Metamask

MetaMask is a browser plugin that functions as an Ethereum wallet and can be installed just like any other plugin (like Decrypt, which Ethereum incubator ConsenSys supports). Once installed, it enables users to store Ethereum and other ERC-20 tokens and send payments to any Ethereum address.

By connecting to Ethereum-based Dapps, users can spend their currencies in games, stake tokens in gambling apps, and sell them on decentralized exchanges. By enabling users to use DeFi programs like Compound and PoolTogether, it also provides a gateway into the emerging world of decentralized finance, or DeFi.

Get started using MetaMask

MetaMask is one of the simplest Ethereum wallets and dapp browsers to use and can typically be set up in only a few minutes, despite its first complex appearance.

To use MetaMask, you will need Chrome, Firefox, or a Chromium-based browser like Brave.

Install the official Metamask extension or add-on for your browser first. Depending on which browser you are using, this will either be the Firefox add-on or the Google Chrome extension. The procedures are essentially the same in other browsers as well, however we'll be using Firefox for this.

You ought to see the splash screen below after installation.

1. To start using MetaMask to construct your Ethereum wallet, click the **`Get Started`** button. Following *figure 4.1* shows the **`Get started`** screen of MetaMask:

Figure 4.1: *"Get started" screen of MetaMask*

2. Click the **`Create a Wallet`** button. Following *figure 4.2* shows the **`Create a Wallet`** screen of MetaMask:

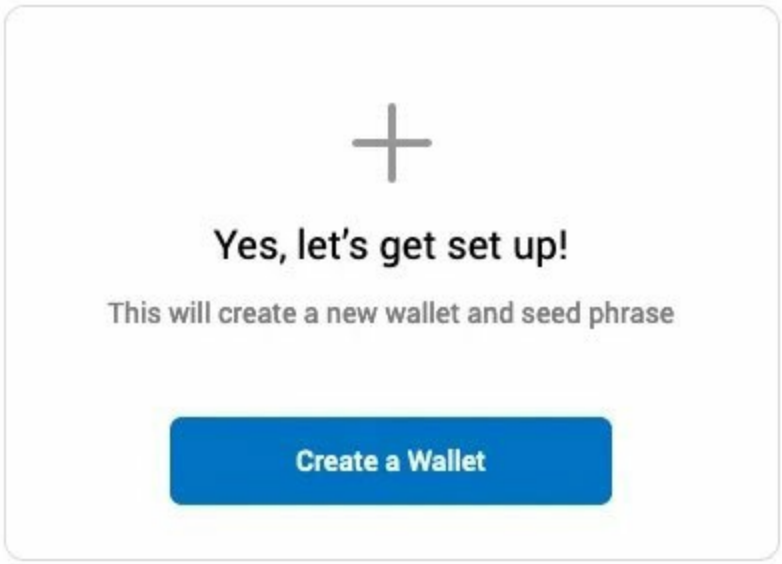

Figure 4.2: *"Create a Wallet" screen of MetaMask*

3. Setup screen for MetaMask

   After that, you will be prompted to contribute to the improvement of MetaMask. Choose "**`No Thanks`**" if you are not interested in this; otherwise, click **`I agree`** *Figure 4.3* below displays the MetaMask setup interface:

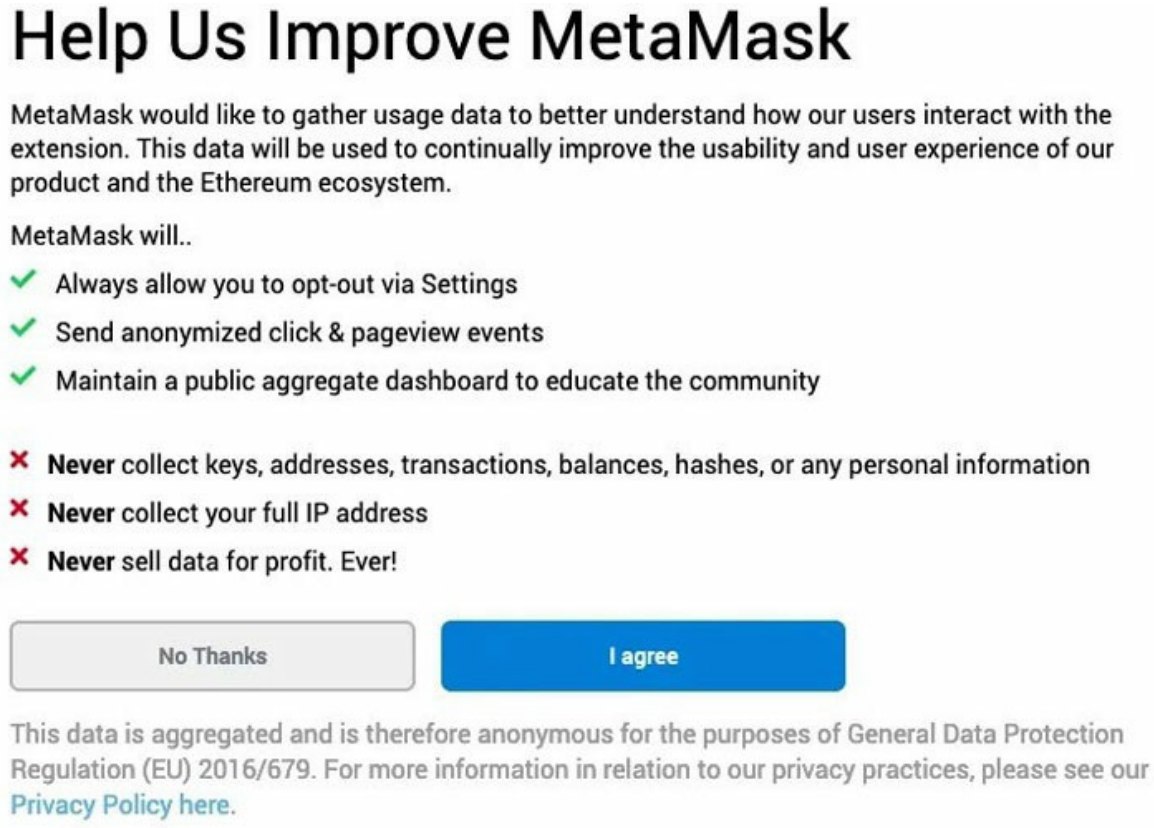
Help Us Improve MetaMask
MetaMask would like to gather usage data to better understand how our users interact with the extension. This data will be used to continually improve the usability and user experience of our product and the Ethereum ecosystem.
MetaMask will..
Always allow you to opt-out via Settings
Send anonymized click & pageview events
Maintain a public aggregate dashboard to educate the community
Never collect keys, addresses, transactions, balances, hashes, or any personal information
Never collect your full IP address
Never sell data for profit. Ever!
No Thanks
I agree
This data is aggregated and is therefore anonymous for the purposes of General Data Protection Regulation (EU) 2016/679. For more information in relation to our privacy practices, please see our Privacy Policy here.

Figure 4.3: *Setup screen for MetaMask*

4. Help us improve MetaMask by using this screen.

   Selecting a password is the following action. This needs to be at least 8 characters long. We advise making a password that is 100 percent original, has never been used before, and combines upper- and lowercase letters, numbers, symbols, and punctuation.

5. Screen for passwords in MetaMask

   Click **`Create`** to create your password after reading and agreeing to the Terms of Service. *Figure 4.4* below displays the screen to create password:

Figure 4.4: *Create a password screen*

Then, MetaMask will show you your 12-word backup phrase. This must be written exactly as it appears on your screen, in that sequence. If you ever lose access to your computer, you will need to use this to retrieve your wallet, so keep it in a secure location. Maintain the secrecy of your 12-word return phrase because anyone who knows it is eligible for a refund.

6. After typing this, choose **`Next.`** *Figure 4.5* displays the secret backup phrase screen:

Secret Backup Phrase
Your secret backup phrase makes it easy to back up and restore your account.
WARNING: Never disclose your backup phrase. Anyone with this phrase can take your Ether forever.
CLICK HERE TO REVEAL SECRET WORDS
Remind me later
Next

Figure 4.5: *Secret backup phrase screen*

7. MetaMask's backup phrase screen

   Type your backup phrase in the exact same order as it was saved before on the following screen to confirm it. After finishing, click **`Confirm`**. *Figure 4.6* below displays the confirm your secret backup phrase screen:

Figure 4.6: *Confirm your secret backup phrase screen*

8. The MetaMask setup is almost complete. After selecting **`All Done`** on the final page, MetaMask will prompt you to log in automatically. If you ever get locked out, you can log back in by clicking the icon supplied by your computer browser (usually found next to the URL bar).

   The MetaMask main interface. *Figure 4.7* displays the MetaMask main interface:

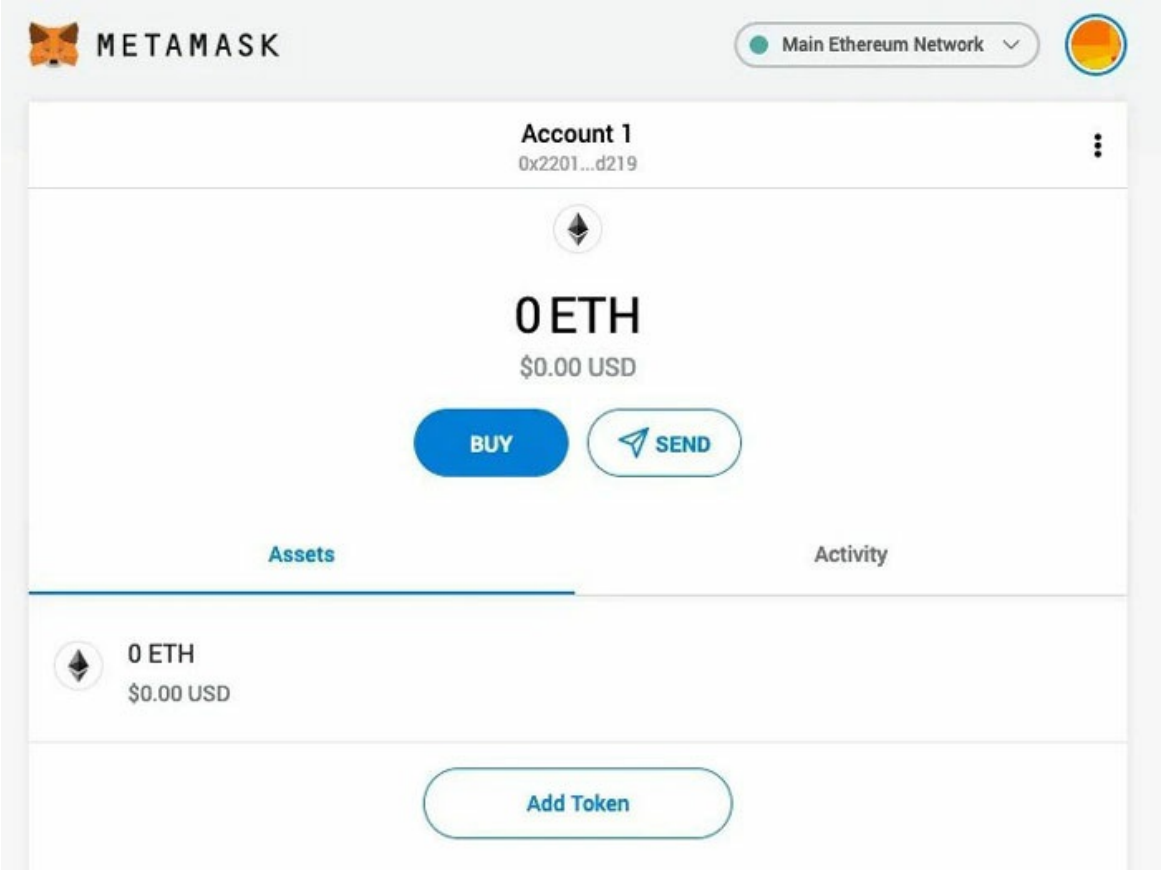

Figure 4.7: *MetaMask main interface*

9. You may access your asset list on the **`Assets`** page, and the **`Activity`** tab will display your transaction history.

   Sending transactions is simple and only requires clicking the **`Transfer`** button, entering the recipient's address, the amount to send, and choosing a transaction fee. In order to acquire a better gas price, you can manually change the transaction cost using the **`Advanced Options`** option and data from services like ETH Gas Station or others.

10. On the screen that appears after clicking **`Next`**, you can choose to accept or reject the transaction. *Figure 4.8* displays the main Ethereum network screen:

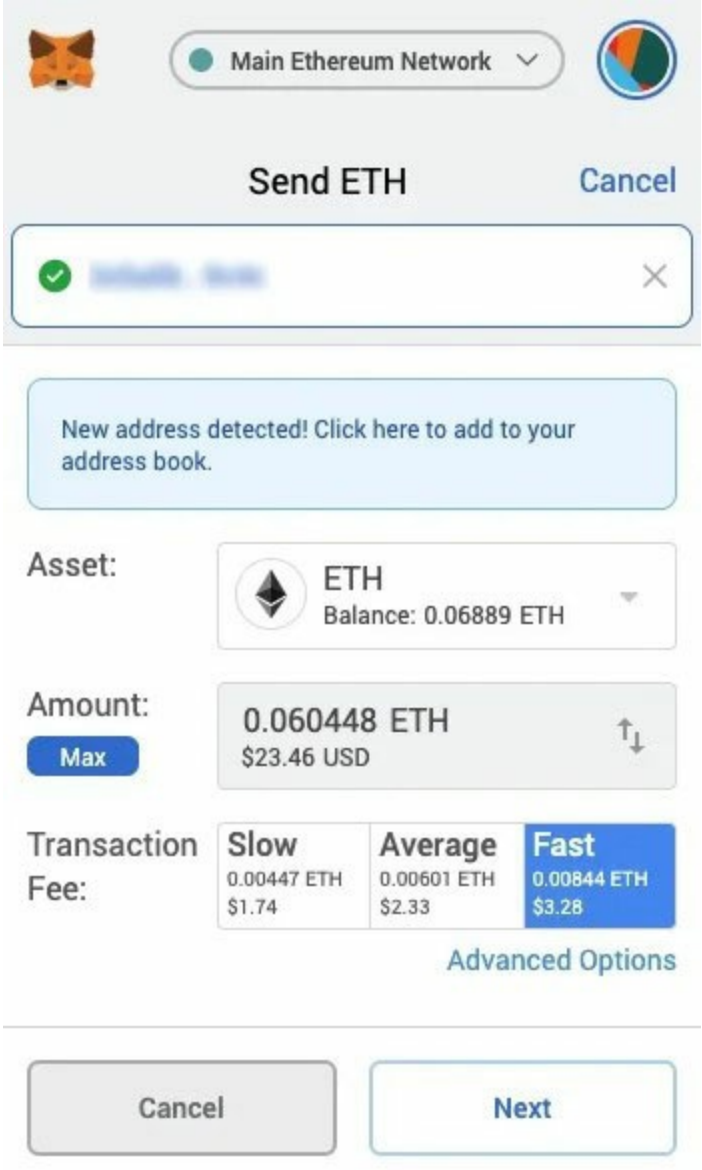

Figure 4.8: *Main Ethereum network screen*

11. To use MetaMask to interact with a DApp or smart contract, you'll typically need to find a **`Connect to Wallet`** button or something similar on the platform you're trying to use. When you choose this, a prompt asking if you want to allow the DApp to connect to your wallet should appear.

    The strategy should work similarly for other DApps. The example below is for Uniswap. A DApp can view your addresses by simply connecting to it, but it is unable to access your money.

    Once you've linked, you can use the DApps' features and interact with

them. *Figure 4.9* below displays the MetaMask notification screen to connect with MetaMask:

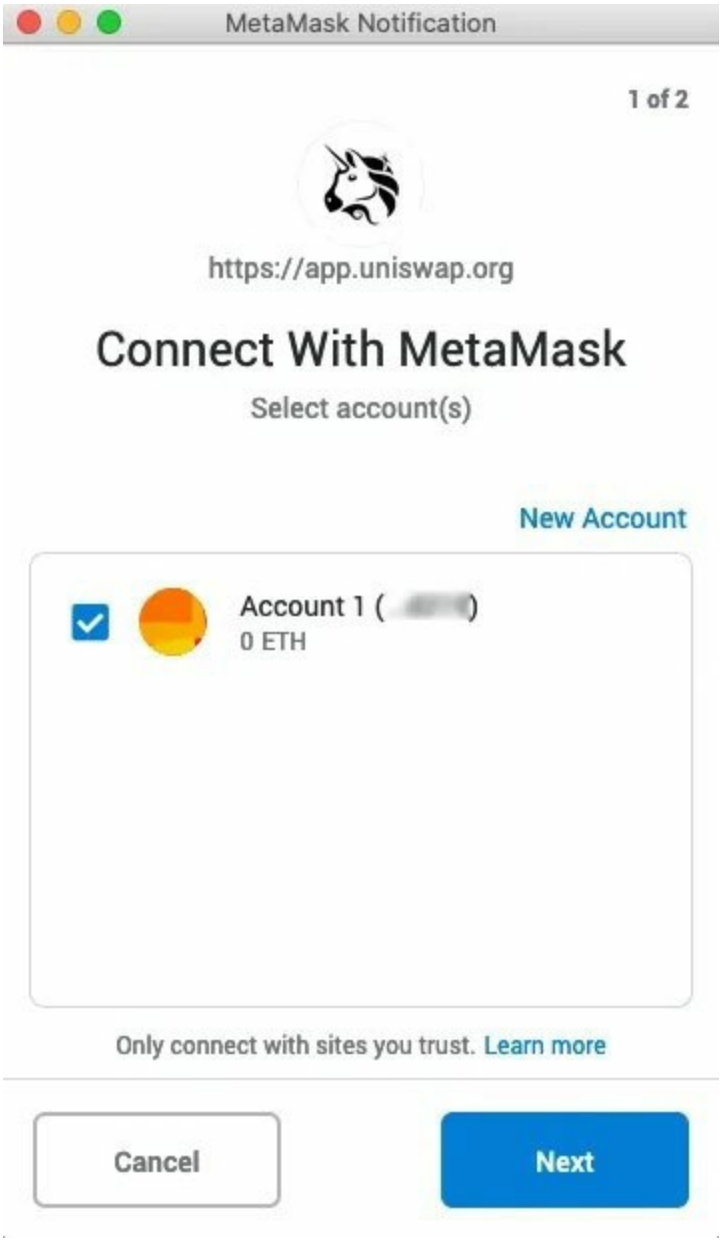

Figure 4.9: *MetaMask notification screen to connect with MetaMask*

Dapps immediately link to MetaMask, simplifying the joining process. A pop-up window within the Dapp will appear if payment is required and ask you to confirm the transaction using your MetaMask account.

Benefits of MetaMask

- **Popular:** Users only need one plugin to access different Dapps because it is extensively used.
- **Easy:** Users do not need to maintain their private keys; instead, transactions are signed on their behalf using a set of words that they must know.
- Since the Ethereum blockchain saves space by sending queries to nodes outside of the user's PC, users do not need to download it.
- **Integrated:** Because Dapps are made to function with it, sending Ether in and out is much simpler.

Drawbacks of MetaMask

A third-party program called MetaMask keeps private keys on users' browsers. A hardware wallet or a paper wallet are more secure than this. In terms of usability, it strikes a good balance.

Alternatives to MetaMask

The various alternatives to MetaMask are:

- **Coinbase Wallet:** A self-contained wallet developed by cryptocurrency exchange Coinbase.
- **Brave Wallet:** This wallet was made by Brave, a browser that uses cryptocurrency and is built straight into the browser.
- **MyEtherWallet** is a well-known online wallet that supports ERC-20 tokens and Ethereum money.

MetaMask's prospects

Since its beginnings, MetaMask has offered a straightforward way to enter the developing dapp ecosystem. The number of users is growing as more dapp products and services are introduced; in February 2020, the Chrome addon will have one million users.

In September 2020, MetaMask Mobile for Android and iPhone became the company's first mobile application.

The smartphone app, which has many features with the browser-based version, allows users to create new profiles or log in with their pre-existing

MetaMask credentials. Users receive a token wallet, key vault, and login in order to manage digital assets and use dApps like Uniswap and OpenSea.

Risk of MetaMask

Let us examine some of the dangers associated with the MetaMask wallet.

Because it is a web wallet, the MetaMask wallet will not have access to your private information, but the browser will track when and how you use the program. For anyone who wishes to use the MetaMask wallet, this might be a deterrent.

Since Metamask mobile features a built-in browser, using it reduces the danger of phishing, hacking, and other online threats.

Only Ethereum and ERC-20 tokens are supported by the MetaMask wallet. As a result, there aren't many other currencies available.

Examples or occurrences can be used to illustrate the following drawbacks of Metamask:

- It can be challenging to locate your wallet and get access to the funds within if you forget the Metamask Secret Phrases. The wallet's associated funds are completely locked and cannot be reclaimed for use in selling or transferring NFTs, that is, many Crypto whale wallets that contain billions of dollars' worth of ETH and BTC in bulk were unable to get their money back because they misplaced the words. Cryptocurrencies were worth pennies when they were purchased in the 2010s, but by 2020, they were worth billions.
- If the private key is disclosed or made available to others, a third party may abuse it. If the private key is compromised, it cannot be changed. Every shareholder is aware of the private key, the company shared wallets were utilized improperly by the shareholders. Multi-signature wallets for investors resulted from this.

MetaMask - A secure program

The main query at this point is: How secure is MetaMask?

Indeed, there have been no notable hacking incidents on MetaMask, which is supported by hierarchical deterministic settings and a sizable user and development community that frequently reviews and updates their source

code.

The main cause for worry is that it is a hot wallet, a cryptocurrency wallet that is online. This makes it vulnerable to theft, hacking, and phishing attacks.

MetaMask in the news in 2022

In a series of tweets on December 25, 2022, MetaMask announced a number of upcoming UI updates. The list included the following items:

- A smoother, more user-friendly user interface.
- A more engaging user experience across several networks.
- Users may monitor their portfolios across platforms thanks to the integration of NFT assets and support with other accounts.
- Despite MetaMask's efforts to enhance security, users are advised to keep their MetaMask wallets closed when not in use and to only open one tab at a time when transacting in cryptocurrencies.

  Here are some other things to keep in mind while using the MetaMask wallet:
- Write down a copy of your personal recovery phrase.

  It's crucial that you safeguard your 12-word recovery phrase for MetaMask because it's the only way to get your account back. It is important to note that your browser automatically encrypts and protects all of your MetaMask data. Therefore, the only way to retrieve your account if you lose it is by using this recovery word.
- Never divulge your private key to a third party.

  Your wallet will be completely accessible to anyone who has your private key or secret recovery phrase. It's advised not to share this information with anyone because MetaMask never requests it.
- As an alternative, think about using a hardware wallet.

A hardware wallet is the safest type of wallet available. If you have a lot of Ethereum or ERC-20 tokens, you should utilize a hardware wallet rather than a software wallet.

Install, use, and secure your MetaMask wallet

An Ethereum wallet called MetaMask fills the gap between standard web interfaces and Ethereum user interfaces (such DApps and Mist browsers) (For example, Google Chrome, Mozilla Firefox, and websites). Every page that your browser loads is supposed to have the web3.js JavaScript library injected into the namespace. Web3.js was produced by the Ethereum core team. Most people use MetaMask as a browser extension. Let's examine how to configure it in Google Chrome.

1. Open the Chrome Web Store and go to the Extensions area.
2. Search with MetaMask.
3. Determine how many downloads there have been to make sure that the authentic MetaMask is installed; hackers may try to make clones. *Figure 4.10* shows the button to add MetaMask to chrome:

Figure 4.10: *Adding MetaMask to chrome window.*

4. From the drop-down option, choose **`Add to Chrome`**.
5. When the installation is finished, this page will show up. Click the **`Get Started`** button to get going. *Figure 4.11* shows the Get started screen of MetaMask:

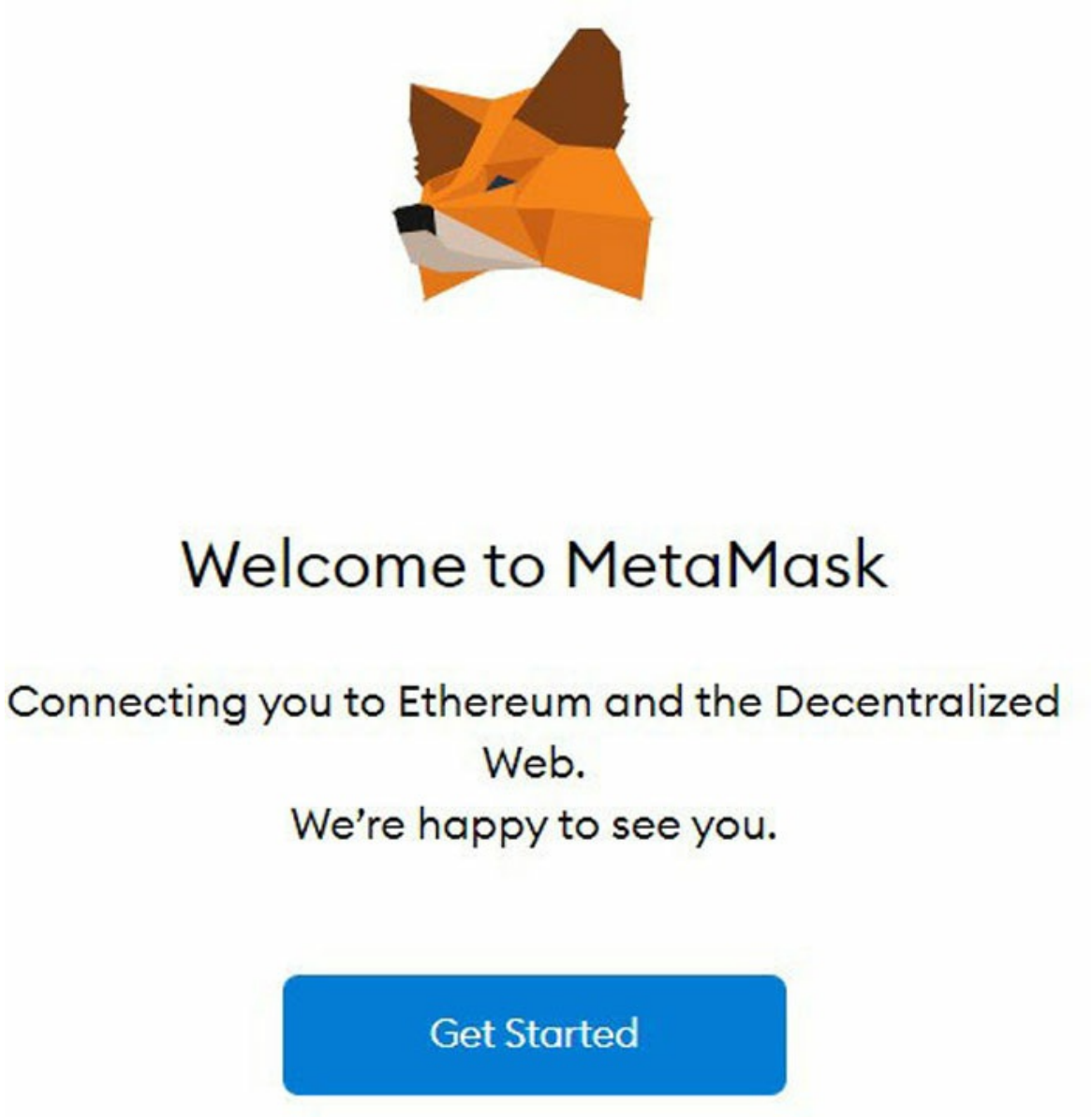

Figure 4.11: *Get Started screen of MetaMask*

6. Choose **`Create a Wallet`** if this is your first time creating a wallet. Using the **`Import Wallet`** button, you can import an existing wallet. *Figure 4.12*, shows the screen to create a wallet:

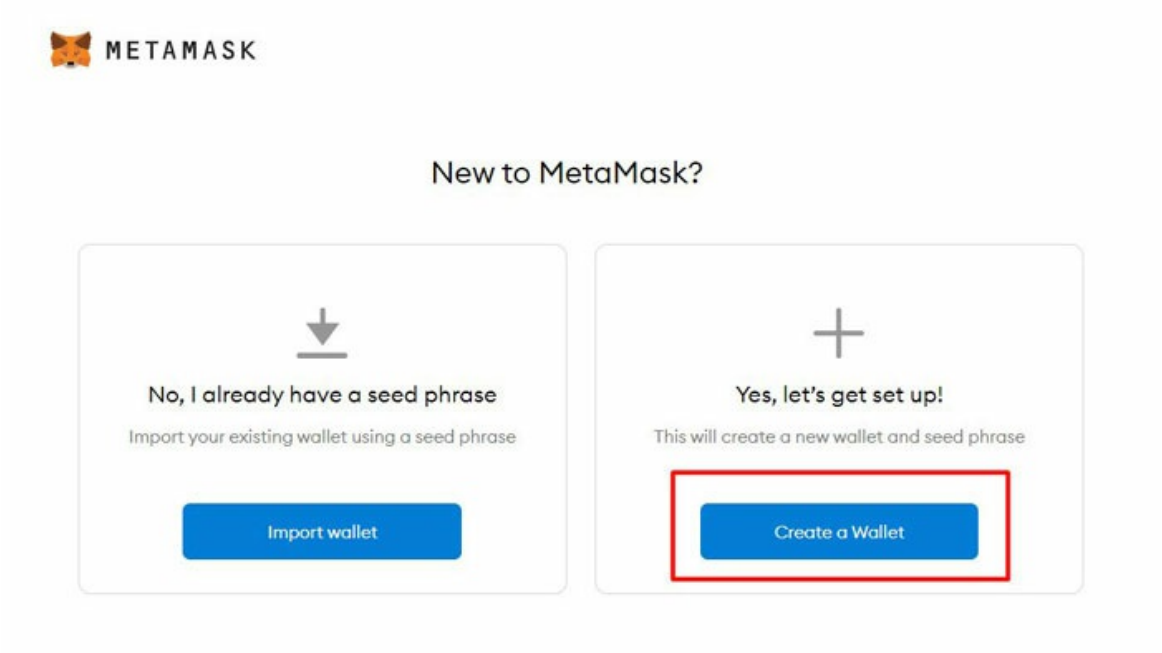
METAMASK
New to MetaMask?
No, I already have a seed phrase
Import your existing wallet using a seed phrase
Import wallet
Yes, let's get set up!
This will create a new wallet and seed phrase
Create a Wallet

Figure 4.12: *Create a wallet*

7. Click the **`I Agree`** box to allow data to be collected to help improve MetaMask; otherwise, select the No Thanks option. The wallet can still be created even if the user clicks **`No Thanks`**. *Figure 4.13* shows help to improve the MetaMask:

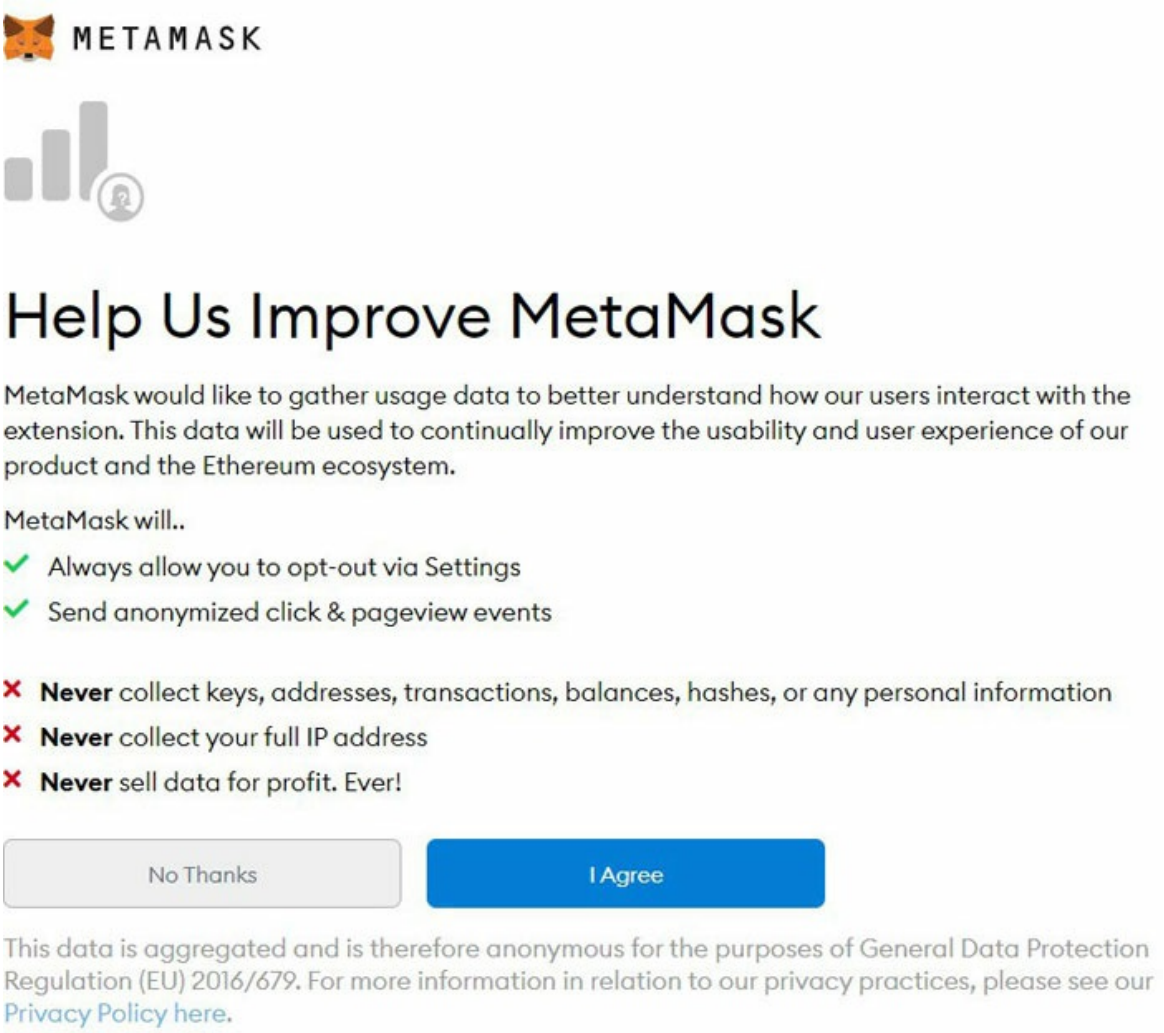
METAMASK
Help Us Improve MetaMask
MetaMask would like to gather usage data to better understand how our users interact with the extension. This data will be used to continually improve the usability and user experience of our product and the Ethereum ecosystem.
MetaMask will..
Always allow you to opt-out via Settings
Send anonymized click & pageview events
Never collect keys, addresses, transactions, balances, hashes, or any personal information
Never collect your full IP address
Never sell data for profit. Ever!
No Thanks
I Agree
This data is aggregated and is therefore anonymous for the purposes of General Data Protection Regulation (EU) 2016/679. For more information in relation to our privacy practices, please see our Privacy Policy here.

Figure 4.13: *Help to improve the MetaMask screen*

8. Make a password for your wallet. This password must be entered each time the browser is launched and MetaMask is required. A new password needs to be created if Chrome is uninstalled or a different browser is used. Use the Import Wallet button if that applies. This is true since MetaMask stores the keys in the browser. Accept the terms and conditions. *Figure 4.14* shows create a password screen:

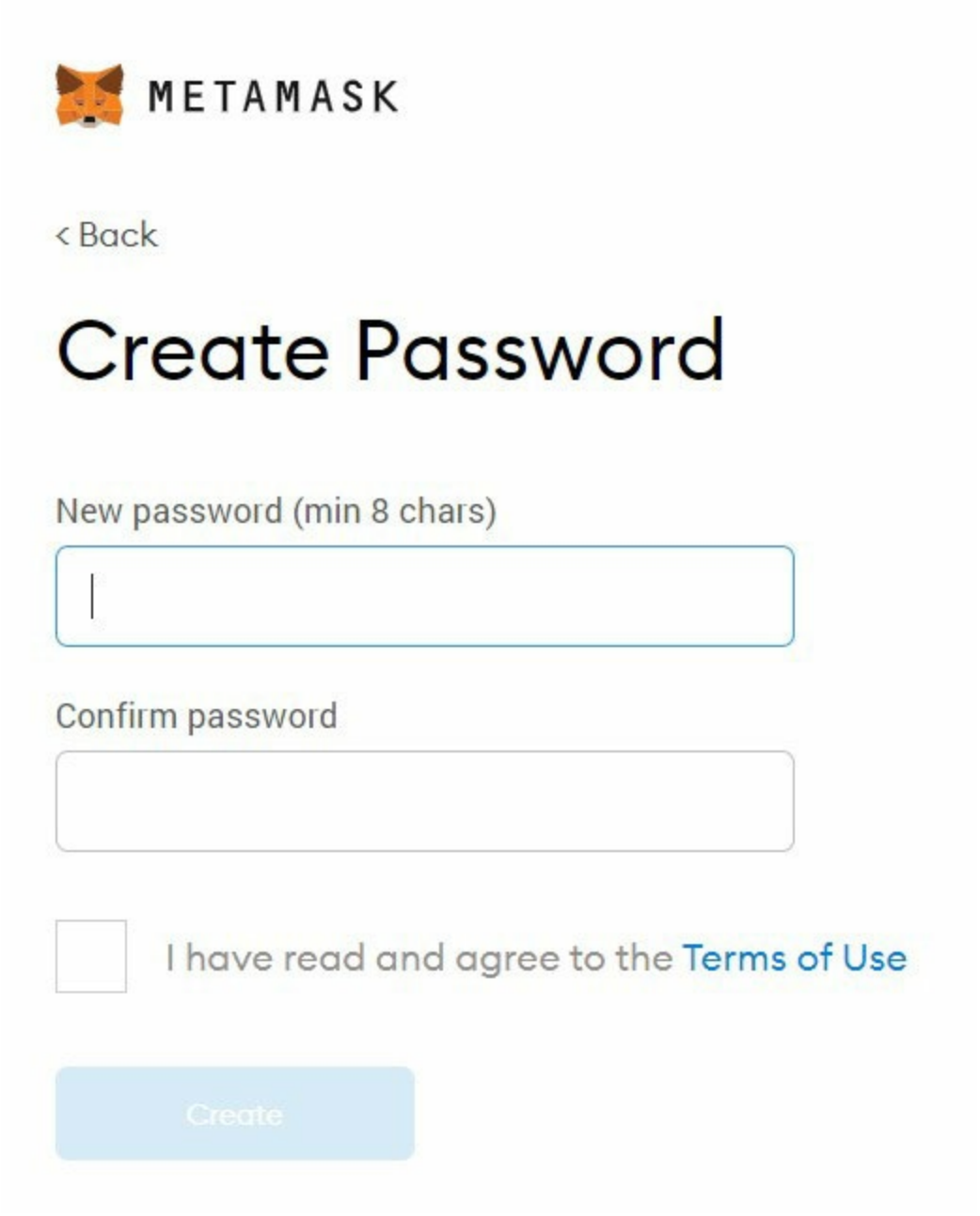

Figure 4.14: *Create a password screen*

9. Place your cursor over the text in the dark area that reads **`Visit this page`** to reveal hidden words to get your secret phrase.
10. This is the most important step. Make sure your secret phrase is built on a strong basis. You should not store your secret phrase to your computer. Please read everything on this screen until you fully comprehend it before moving further. The secret phrase is the only way to access your wallet if you forget your password. Click the **`Next`** button

when you are done. *Figure 4.15* shows secret backup phrase screen:

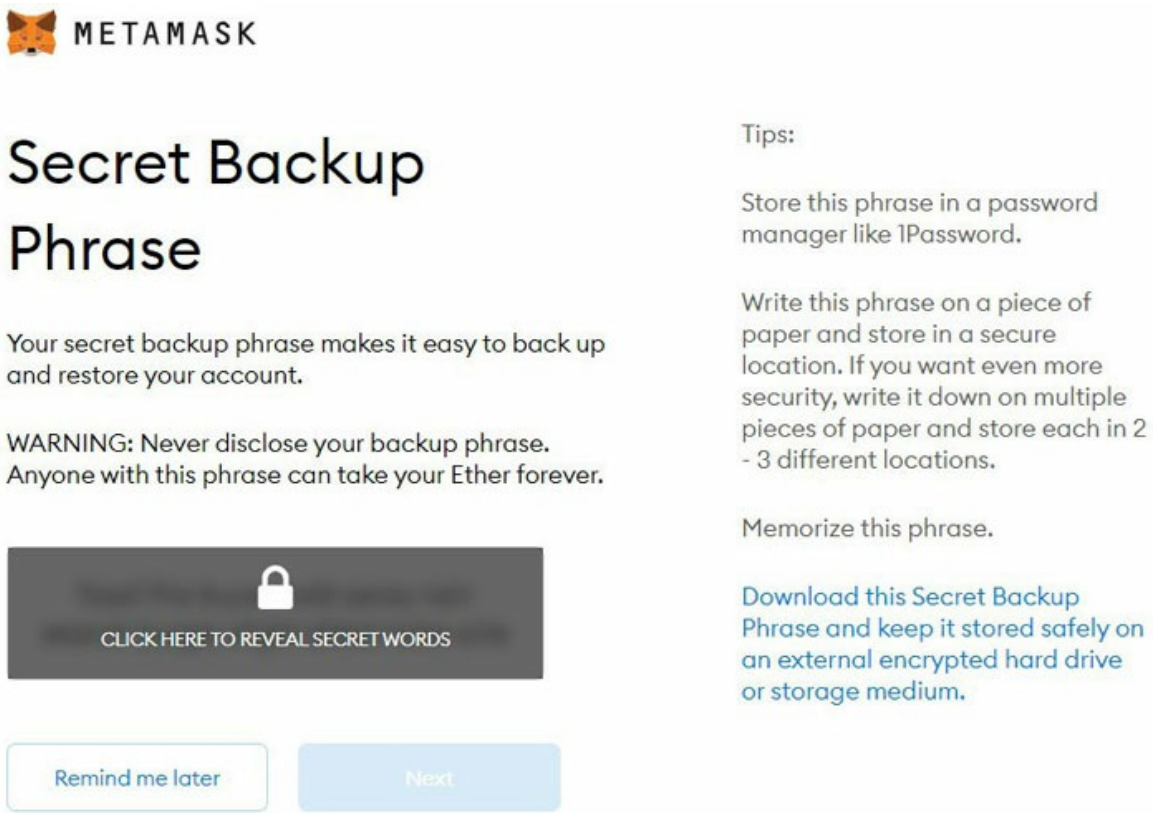
METAMASK
Secret Backup Phrase
Your secret backup phrase makes it easy to back up and restore your account.
WARNING: Never disclose your backup phrase. Anyone with this phrase can take your Ether forever.
CLICK HERE TO REVEAL SECRET WORDS
Remind me later
Next
Tips:
Store this phrase in a password manager like 1Password.
Write this phrase on a piece of paper and store in a secure location. If you want even more security, write it down on multiple pieces of paper and store each in 2 - 3 different locations.
Memorize this phrase.
Download this Secret Backup Phrase and keep it stored safely on an external encrypted hard drive or storage medium.

Figure 4.15: *Secret backup phrase screen*

11. In the order that the words in your seed phrase appear in your seed phrase, click the buttons. Or to put it another way, type the seed phrase into the button on the screen. If everything is done correctly, the **`Confirm`** button should turn blue. *Figure 4.16* shows confirm your secret backup phrase screen:

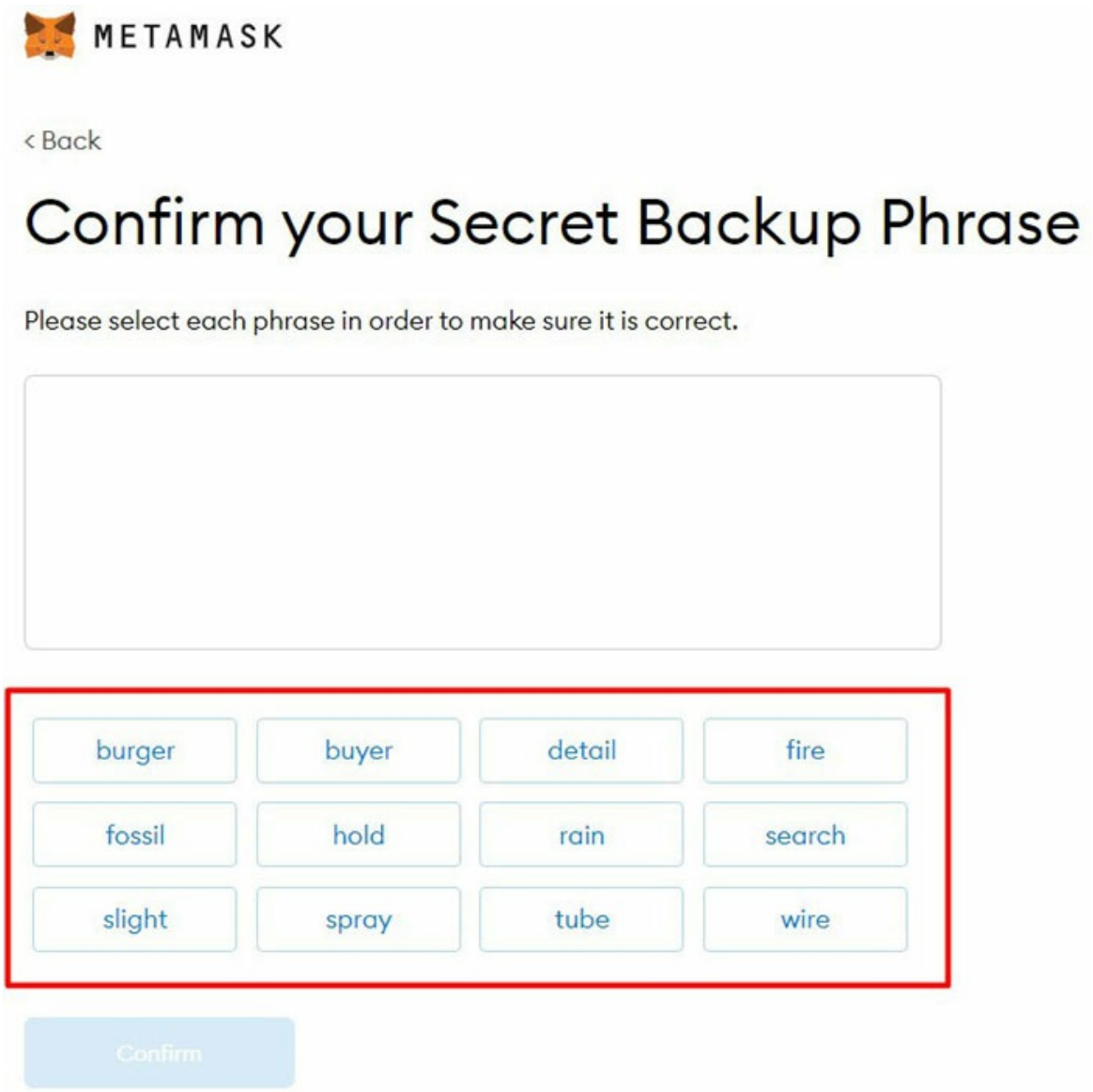

Figure 4.16: *Confirm your secret backup phrase screen*

12. By using the Confirm option, you can confirm your choice. Please heed the recommendations made. *Figure 4.17* shows confirm screen:

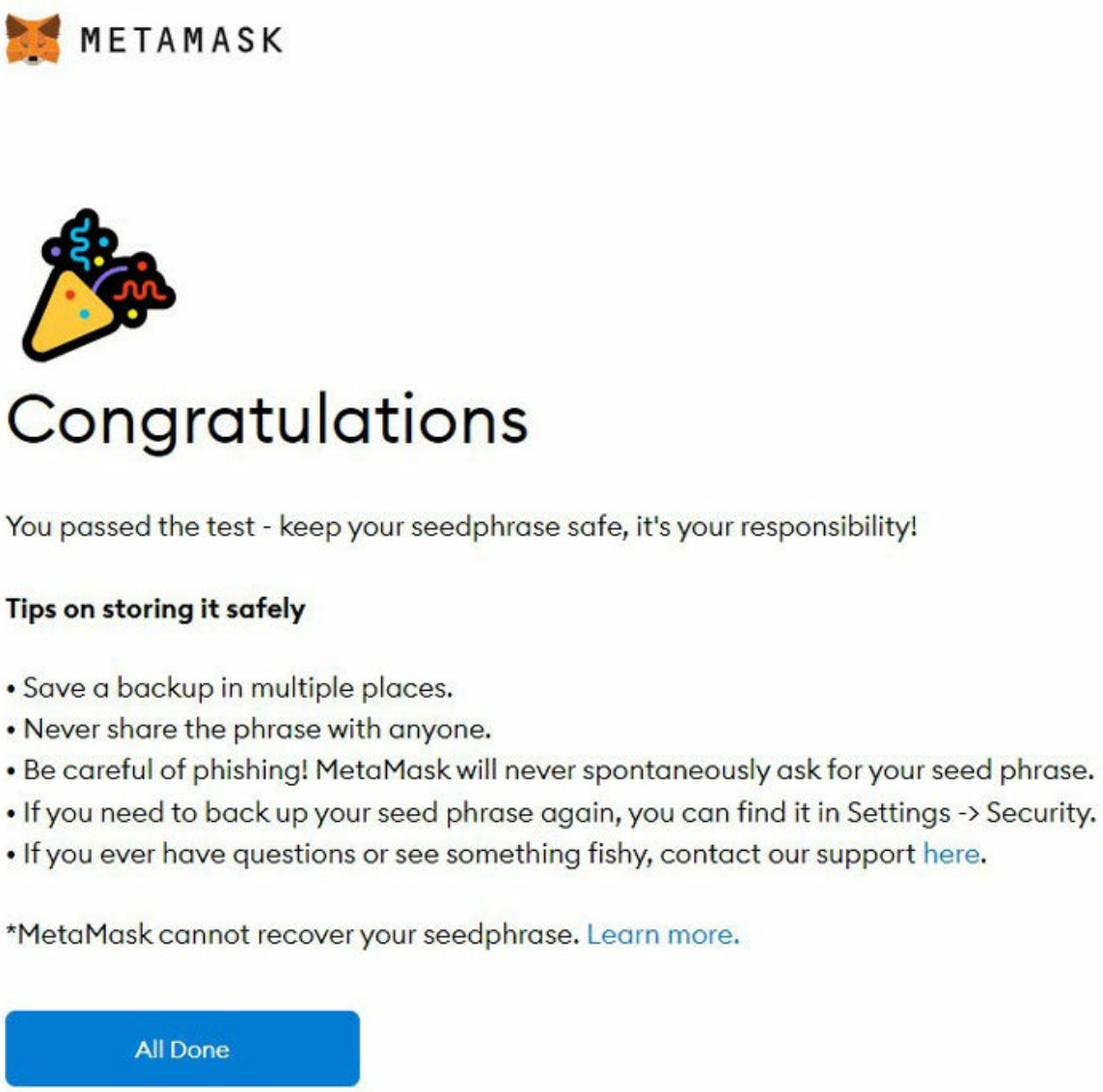
METAMASK
Congratulations
You passed the test - keep your seedphrase safe, it's your responsibility!
Tips on storing it safely
• Save a backup in multiple places.
• Never share the phrase with anyone.
• Be careful of phishing! MetaMask will never spontaneously ask for your seed phrase.
• If you need to back up your seed phrase again, you can find it in Settings -> Security.
• If you ever have questions or see something fishy, contact our support here.
*MetaMask cannot recover your seedphrase. Learn more.
All Done

Figure 4.17: *Confirm phrase screen*

13. One can check the account's balance and copy the account address by choosing the **`Account 1`** section. *Figure 4.18* shows **`Add Token`** screen to Account1:

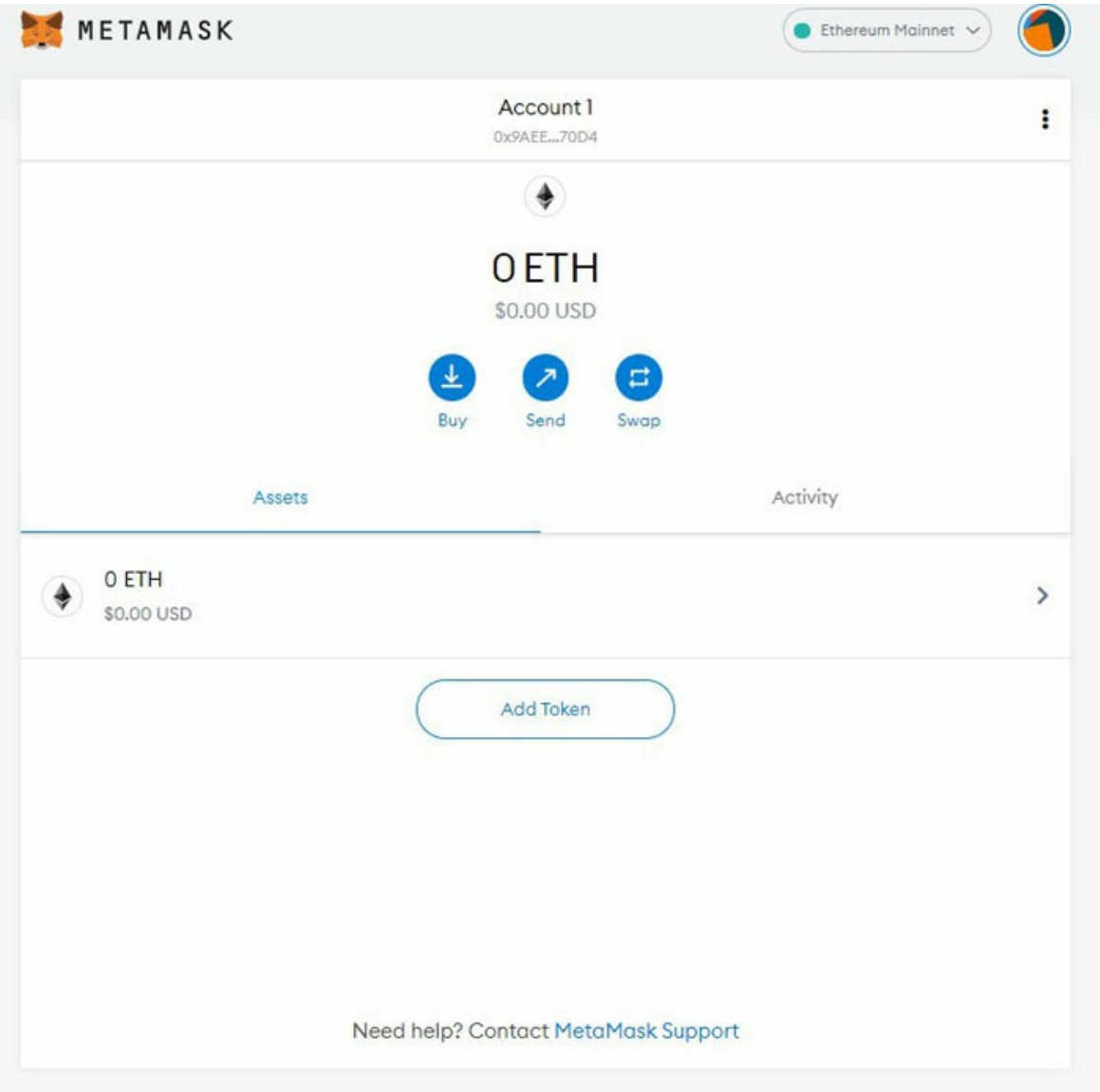

Figure 4.18: *Add token screen to Account1*

14. To access MetaMask in the browser, go to the top right and click the Foxface icon. Click the puzzle piece symbol next to the Foxface icon if you cannot see it. *Figure 4.19* shows the Foxface icon.

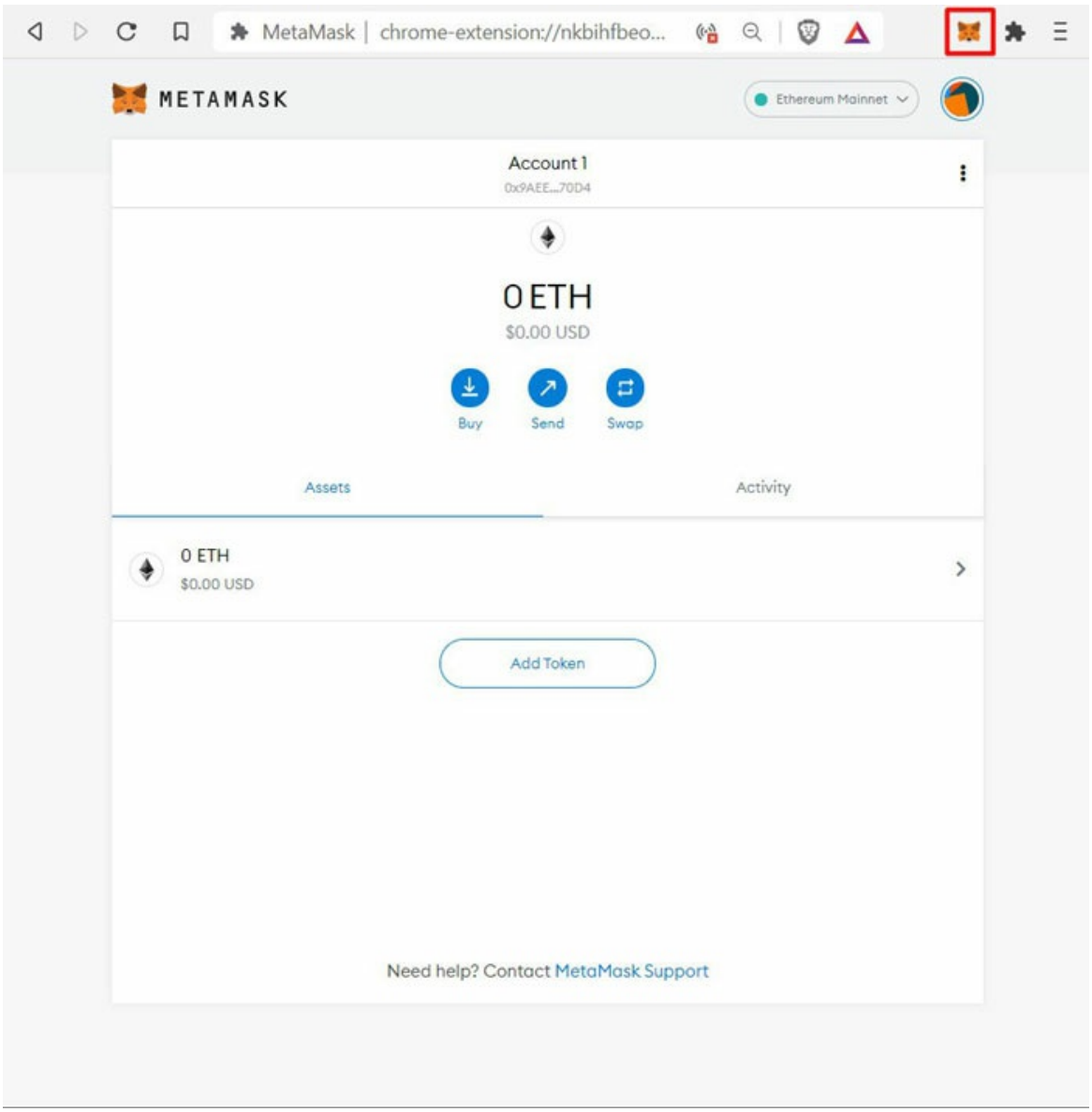

Figure 4.19: *Foxface icon*

Step-by-step guide on using MetaMask

With the help of the well-liked browser extension MetaMask, you can keep your Ethereum and other ERC-20 tokens safe. Web apps are able to read and communicate with the Ethereum blockchain thanks to the free and secure extension.

Initially, install MetaMask on your browser.

You have to install the extension before you can create a new wallet. Depending on your browser, there are several markets where you can find it.

Finding MetaMask is not difficult because it is sold in most browser stores; nonetheless, below are the stores for Chrome, Firefox, and Opera.

We will use Google Chrome as an example, but the techniques work with other browsers as well. You can locate it by typing MetaMask Extension into your chosen search engine if the preceding links are not functional for you.

1. You can add MetaMask to Google Chrome by clicking the Install MetaMask as a Google Chrome extension button.
2. Add by selecting the button and Chrome.
3. Add Extension can be chosen from the drop-down menu.
4. Installing the extension on your browser is all that's required; continue reading to find out how to create an account in the next step.

Step 2: Register for an account.

Follow the given steps to register an account:

1. Click the extension icon in the top right corner to launch MetaMask.
2. To receive the most recent version and keep current, click Try it now.
3. Hit the Enter key to continue.
4. Your new password selection will be required. From the drop-down option, choose Create.
5. To proceed, click Next while concurring to the terms of service.
6. From the drop-down option, choose Reveal Secret Words. A 12-word seed phrase appears there. Take your time and write this down because it is important information that shouldn't be saved electronically.
7. To confirm your secret phrase, choose the phrase that was previously made. By pressing the button, confirm.
8. You've successfully created a MetaMask account, so that's it. A fresh Ethereum wallet address has been created for you. The step that follows will explain how to deposit money into it as it waits for you to do so.

Step 3: Make a deposit.

To make a deposit follow the given steps:

1. Click View Account to view your account.
2. Others can now access your public address and share it with them. You

can get money through MetaMask in a number different methods, but you can also do it yourself with just your address.

3. The MetaMask extension will always be available in the toolbar of your browser, ready for you to carry on with your cryptocurrency exploration. It is easily accessible, and as these instructions show, it is also simple to use. The process of sending coins is also simple; all you need to do is press a prominent send button. However, if something goes wrong and you need to retrieve your account, you have this choice. You must first back it up, so let's look at how we may do that.

Usage of Seed phrase to backup and restore the wallet

Follow these steps to reconnect to your wallet if you switch your browser or computer. You must first find your seed phrase, which you should have stored beforehand.

1. From the drop-down menu, choose the account icon.
2. From the drop-down menu, pick Settings.
3. When you locate it, click Reveal Seed Words.
4. Enter your password here.
5. Now, somewhere that is preferably not on your computer, write down the Secret Seed Phrase. You only need to figure out how to restore the data now that you've finished the backup.
6. Launch Metamask by entering the account seed phrase, then select Import.
7. Using your Seed Phrase, fill in the gaps.
8. Create a fresh, strong password.
9. Restore can be chosen from the menu.
10. That's all there is to it; by following these easy instructions, you were able to get your account back.

Secure your MetaMask wallet

The following security recommendations will help you protect your Metamask account when using the Metamask browser extension and mobile app. Use these broad recommendations to protect your Metamask wallet.

1. Don't ever access the wallet on a shared computer.
2. Use a desktop wallet rather than a mobile one. Compared to a PC, a phone is simpler to access, steal from, or corrupt.
3. Save a copy of your seed phrase somewhere safe.
4. To keep your password and seed phrase safe, use a password manager like LastPass or KeePass.
5. Create a backup on paper or in a treasured book that you would never lose.
6. It is a good idea to back up your secret phrase and password in three different locations.
7. Another method is to "salt the password, and use a secret phrase backup." E.G.
8. If your password is password1Secure, alter it to password15SecureSecret5, and write your salt words somewhere else. An excellent example of a salt phrase is "Secret 5."
9. Make a secure hashed password with the aid of a password manager.
10. Ensure that your browser addons are current. Any unnecessary browser addons should be disabled. With the help of browser plugins, you may easily record your screen or log your keystrokes.
11. Regularly scan your computer with anti-virus and anti-malware software to look for spyware or keylogging program.
12. Regularly delete the cookies and history from your browser.
13. Make sure Metamask is locked when not in use.
14. Deactivate or turn off the Metamask add-on when not in use.
15. If you have a sizable amount of cash, consider creating many accounts in your wallet and distributing your investment among them.
16. Treat your device like a vault to protect your password from theft and devastation since it can only be used on that particular device.

Conclusion

Some of the best NFT games available right now have been covered in detail in this chapter. In the game-fi sector, NFT games are becoming more and more popular as a way to make money. Tokens can be obtained through play-

to-earn models, and you can also sell your NFTs to other gamers and collectors within the game.

Then, we talked about MetaMask, its risk, how to install or secure your wallet for MetaMask and need to purchase Ether to use the MetaMask wallet

At the end, we have covered the step-by-step instructions for using the MetaMask.

We shall study about cryptocurrency and NFTs in the following chapter. NFTs and cryptocurrencies differ greatly from one another. Both are based on Blockchain, but that is where the similarities end.

Key terms

- **Play-to-earn NFT games:** It allow players to earn money.
- **Unchained gods:** A tradeable NFT card game similar to Magic: The Gathering or Hearthstone, Gods Unchained is based on Ethereum.
- **MetaMask:** A browser plugin that functions as an Ethereum wallet and can be installed just like any other plugin.

Multiple Choice Questions

1. **_____ NFT game is based on the Pokemon idea and features creature collection and combat.**
    a. Axie Infinity
    b. Sorare
    c. Unchained gods
    d. Magic: The Gathering or Hearthstone
2. **NFTs are one-of-a-kind digital collectibles that exist on the:**
    a. Ethereum
    b. Cloud
    c. Blockchain
    d. Binance
3. **_____ is among the most well-known play-to-earn games.**

a. Sorare
b. Axie Infinity
c. Magic: The Gathering or Hearthstone
d. Unchained gods

4. **On the Binance _____provide an NFT gaming experience.**
    a. NFT Marketplace
    b. NFT Mystery Boxes
    c. Collection Partnerships
    d. All of the above
5. **_____ is one of the simplest Ethereum wallets.**
    a. MetaMask
    b. Binance
    c. Ethereum
    d. Blockchain

Answers

1. **d**
2. **c**
3. **b**
4. **d**
5. **a**

Join our book's Discord space

Join the book's Discord Workspace for Latest updates, Offers, Tech happenings around the world, New Release and Sessions with the Authors:

https://discord.bpbonline.com

CHAPTER 5

NFTs: A Cryptocurrency

You examined the games related to NFTs in *Chapter 4, Understand the Game of NFTs*. Since the notable virtual kittens' craze of 2017, the acceptability of NFTs has grown, creating a lucrative market for the online gaming industry. In-game collectibles can be purchased in NFT games, which are blockchain games that allow players to buy them. These collectibles can then be used as weapons to fulfil tasks or sold to other players in the game or on other NFT markets. NFT-based games offer not only a thrilling experience but also potential rewards.

You will learn about NFTs and cryptocurrency in this chapter. NFTs and cryptocurrencies differ greatly from one another. Both are based on Blockchain, but that is where the similarities end.

A fungible or interchangeable kind of money is a cryptocurrency. For instance, if you already own one cryptocurrency token, such as Ethereum, the next one you acquire will have the same value. NFTs, however, are non-fungible, which means that one NFT's value is not the same as another's. Every work of art is unique and non-fungible since it differs from the others.

Anyone who has a bitcoin wallet is able to buy an NFT. That is the only prerequisite for getting an NFT. You don't need any KYC documentation to purchase art. To purchase and sell NFTs, you need an NFT marketplace and a cryptocurrency wallet supported by Metamask.

In this chapter, we will go into great detail about investing in NFTs.

Structure

In this chapter, we will cover the following topics:

- NFTs: a cryptocurrency or not
- Investing in NFTs

Objectives

After studying this chapter, you should be able to know if NFTs are a cryptocurrency or not; and the steps to invest in NFT and NFT investing strategies.

NFTs: A cryptocurrency or not

But how can the differences between NFTs and cryptocurrencies be explained?

Since "non-fungible tokens" is a mouthful, we understand why it is almost always shortened to "NFT." What are they, how do they operate, and what are the benefits?

The meaning of NFTs

NFTs are immutable blockchain-based digital tokens that may transport data. Its main purpose is to stand in for assets and demonstrate their legality and ownership.

A secure and accessible record of the object's presence may be kept and accessed, whether the item is present physically or online. Such records cannot be changed, amended, or tampered with because of the structure of the blockchain.

The World Wide Web's original source code, works of art, rare diamonds, musical compositions, and rare jewels are all examples of valuable assets.

When an asset with an NFT token is exchanged physically or digitally, the blockchain creates a new 'block' with the details of the new owner.

Each transaction will result in the creation of a chain of information, and ownership tracking along the chain will make it easy to confirm the object's veracity and provenance.

NFTs, or non-fungible tokens, are widely used today. These digital assets, which range from tacos and toilet paper to tacos and exquisite Dutch tulips from the 17th century, are selling for millions of dollars at times.

But do NFTs live up to the buzz or the cost? Like the dot-com bubble or Beanie Babies, some experts believe they are a bubble that is about to burst. Others think NFTs are here to stay and will fundamentally alter investment.

A digital asset known as NFT is a representation of real-world items, such as artwork, music, in-game items, or films. They are regularly purchased and traded online in exchange for cryptocurrencies, and they are typically encoded using the same software as many other cryptos.

NFTs have been around since 2014, but they are just now becoming well-known since they are a more and more common way to acquire and trade digital art. In 2021 alone, the market for NFTs was estimated to be worth a remarkable $15.70 billion USD, and by 2028, it is anticipated to be worth $122 billion USD.

NFTs often have unique identification codes and are one of a kind or at least one of a very small run. Arry Yu, managing director of Yellow Umbrella Ventures and chair of the Cascadia Blockchain Council for Washington **Technology Industry Association asserts that NFTs essentially produce digital scarcity.**

This contrasts sharply with the majority of digital works, which nearly always have an endless supply. Theoretically, if an asset is in demand, reducing its supply should increase its value.

However, many NFTs, at least in the early going, have been digital works that have been securitized versions of digital artwork that has already circulated on Instagram or legendary video clips from NBA games.

The most well-known NFT of 2021, "EVERYDAYS: The First 5000 Days," was created by renowned digital artist Mike Winklemann, often known as "Beeple," using a composite of 5,000 daily drawings. It was sold at Christie's for a record-breaking $69.3 million.

NFTs will become the key component of a life that is "digitally native": MetaKovan

Vignesh Sundaresan, aka MetaKovan, has been involved with cryptocurrencies even before they were widely accepted. A record $69.3 million (about Rs 520 crore) was spent earlier this year by Indian-born blockchain entrepreneur Vignesh Sundaresan, commonly known by his crypto moniker MetaKovan, to purchase a digital artwork by the artist Beeple. He now requests that everyone download a free copy of Everydays: The First 5000 Days, a non-fungible token (NFT). He thinks that an NFT is beautiful when everyone can enjoy it.

The individual photographs, as well as the full collage of images, are

available for free Internet viewing by anybody. So why do people want to pay millions for something they can just download or take a screenshot of?

Since an NFT enables the buyer to retain ownership of the original item. Additionally, it has built-in authentication that serves as ownership confirmation. The "digital bragging rights" are almost more valuable to collectors than the actual item.

A refresher on blockchain

Blockchain is used in decentralized banking (such as bitcoin), decentralized identity management, immunization passports, and naturally, NFTs.

- Blockchains are unalterable (immutable) ledgers that store information about ownership, intellectual property, and transactions.
- Data is considered "immutable" once it has been added to a block in a blockchain ledger system since it cannot be changed, updated, or tampered with beyond that point.
- Cryptographic algorithms combine the records into "blocks," which are then linked together in a "chain" to form the data.
- All devices in the chain's members contain the ledger (referred to as "nodes").
- "Anyone may join public blockchains of cryptocurrencies like Bitcoin (BTC) and Ether (ETH), and the transactions are open to everybody (but identities can primarily be kept private)."
- NFTs are a sort of cryptocurrency; the quick response is no.
- NFTs are not cryptocurrencies; despite the fact that combining the two makes sense. The reason for this is because NFTs and other cryptocurrencies like Bitcoin and Ether both utilize the same blockchain technology.
- Contrary to cryptocurrencies, NFTs lack an inherent value in terms of money; instead, their existence symbolizes a collection of goods with various monetary values (such as art, songs, property, and so on.). They are not economically fungible as a result, whereas cryptos like BTC and ETH are (can be traded and has innate value).

NFTs and their science

In addition to being immutable and unique (no two NFTs are the same), NFTs include three more distinctive features—some of which cryptocurrencies lack—that allow them to fulfil their intended function.

The three distinctive features of NFTs are:

- Indivisibility

  It is impossible to split up a non-fungible token into smaller bits (or sub-blocks). In contrast, the value of cryptocurrencies like Bitcoin is determined by how challenging it is to obtain a single block piece.

  As a result, the value of these blocks can be divided among numerous owners, and their ownership is verified on the open blockchain.

  NFTs, on the other hand, are indivisible and cannot be separated because doing so would negate their purpose as a single token of data information if many parties were able to claim ownership.

  However, theoretically speaking (for example, as a percentage share of the NFT), fractional "ownership" of an NFT is only possible; the asset itself is unaffected.

- Indestructibility

  Even if the asset represented by the NFT is physically destroyed, the token asset is indestructible by nature due to its blockchain construction.

  This is so that the information (such as the ownership chain) stored on the blockchain will endure for the duration of the blockchain platform.

  This enables the determination of the ownership history of a real or virtual object (such as a lost work of classical art).

  As a result, this might be utilized to identify fake goods now in circulation or serve as a secure, irreversible record for archival purposes.

- Provenance

  The blockchain on which the asset was formed will be used to store the asset's whole NFT-based ownership record.

  Every NFT connected to an item can therefore be traced back to its original location.

This enables a blockchain owner to confirm the legitimacy of a physical or digital asset, regardless of how many times it has been bought, sold, or exchanged.

NFT vs Crypto

It's likely that a person you meet who dabbles in non-fungible tokens also trades cryptocurrencies. Both cryptocurrencies and NFTs are founded on the same software and technology, both made their public debuts around the same time, and both represent a distinct class of hazardous, exciting, and young people-dominated investments.

Even yet, even if cryptocurrency is viewed as a token rather than a coin, non-fungible tokens are not a type of cryptocurrency. Despite their many similarities, cryptos and NFTs are poles dissimilar.

What you should know is as follows.

First, the similarities.

Despite the fact that cryptocurrencies and NFTs are not the same things, conventional investors can be excused for doing so.

Both are digital assets, and while cryptocurrency gained popularity earlier, news of both spread to the general public at roughly the same time in the late 2010s. According to Forbes, the NFT industry split off from the crypto culture and is frequently purchased and sold alongside cryptocurrencies. Both also tend to draw the same participants. The similarities between the two end there; they are both created using the same programming, encoded using the same underlying software, and secured in digital wallets.

The ABCs of Crypto

In a decentralized, encrypted digital payment system, cryptocurrencies like Bitcoin aren't issued by banks or supported by a centralized body like a government. Forbes estimates that there are over 19,000 of them.

Trust in the bank, the government, and the FDIC insurance underpins the value of the conventional currency. On the other hand, the value of cryptocurrencies is derived from the cryptographic proof of transactions that are validated and documented on a particular class of database known as a blockchain.

Some people use cryptocurrencies as a form of exchange to make purchases or to pay for goods and services, much like they do with dollars. However, most people invest in cryptocurrencies the same way they would in stocks: as a good or security they believe will appreciate in value over time, but compared to stocks, cryptocurrencies are much more unpredictable. They have the speed to change their percentage points by hundreds, thousands, or even tens of thousands.

The Heck of NFTs

NFTs are digital tokens that signify ownership of individual goods like songs, videos, and photos. Like Picasso, a digital image can be copied indefinitely many times, yet the value of both NFTs and oil paintings remains solely in the irreplaceable original.

The founder of Twitter, Jack Dorsey, sold an NFT of his very first tweet for more than $2.9 million. NFTs are digital files that can represent ownership of anything.

They are created utilizing the same blockchain technology that made cryptocurrencies popular. Although they can also be found on other blockchains, they are primarily housed on the Ethereum network, according to Forbes.

Similarly to cryptocurrencies, blockchain technology makes it difficult for many people to hold an NFT at once and makes it simple to confirm ownership and transfer tokens from one owner to another.

The ‘F’ in ‘NFT’

Because cryptocurrencies are fungible, they can be used in place of one another.

The same as exchanging a dollar or an ounce of gold for a Bitcoin; neither party gets or loses anything when two people trade.

On the other hand, every NFT is special. Blockchain technology is used by NFTs to verify the legitimacy of that uniqueness. NFTs are non-fungible, just like baseball cards and beanies. They are only worth what a buyer is prepared to pay for them based on immaterial factors like desirability.

For the same reason that art collectors spend millions on Picassos whether

they like the painting itself or not, collectors buy in-demand ETFs that are in high demand. The dignity of holding the original is everything.

The ability to be exchanged for one another, or fungibility, is what distinguishes cryptocurrencies as a reliable method for carrying out blockchain transactions.

NFTs could never be utilized as a form of payment or as a reward for blockchain mining because each NFT is distinct.

Related, but different

A non-fungible Token is referred to as an NFT. Although it is typically developed using the same type of programming as cryptocurrencies like Bitcoin or Ethereum, the similarities end there.

Having the ability to be sold or exchanged for one another, physical money and cryptocurrencies are both "fungible." A dollar is always worth another dollar and the value of one Bitcoin is always equivalent to the value of another Bitcoin. Due to its fungibility, cryptocurrency is a reliable method for blockchain transactions.

Blockchain transactions are necessary for the authentication and ownership recording of both cryptocurrencies and NFTs; in most circumstances, you need cryptocurrencies to buy NFTs.

The main distinction is that cryptocurrency's value is entirely economic and derives from its usefulness as a medium of exchange or investment. On the other hand, NFTs are valuable in both economic and non-economic ways. NFTs can be used by artists to sell, market, and even autograph their creations, which might then be purchased with cryptocurrency by an investor or collector.

NFTs are unique. Since they are all digitally signed, NFTs cannot be traded for or equaled with one another (hence, non-fungible). For instance, just because two videos are NFTs doesn't mean that one NBA Top Shot clip is equivalent to EVERYDAYS. (For that matter, one NBA Top Shot clip isn't even always equivalent to another.)

Investing in NFTs

Despite having no physical presence, NFTs, or Non-Fungible Tokens, can be

bought and sold on exchanges just like other assets. Both the digital content's creator and the exchange's customer are taking part.

With multi-million-dollar sales on exchanges this year, **Non-Fungible Tokens** (**NFTs**) are a new sort of cryptocurrency that is gaining popularity by the day. **High-Net-Worth Individuals** (**HNIs**) and **Ultra-High-Net-Worth Individuals** have expressed interest in them (**UHNIs**).

But precisely what is an NFT? Is it under any kind of control?

The two-part series from money control dispels common misconceptions about NFTs and investigates whether they make good investments. *Figure 5.1* shows investing in NFTs:

Figure 5.1: *Investing in NFTs*

A novel kind of digital asset is called an NFT (non-fungible token). Some people are looking into NFTs as a quick way to get rich after the recent boom in cryptocurrencies like Bitcoin, Ethereum, and Dogecoin. The past few months have seen numerous news stories about NFTs. For instance, the creator of the 2011 meme Nyan Cat auctioned off an animated GIF of the character for more than $500,000 as an NFT in February. Similar to this, the

parents of the original video creators of the well-known YouTube video "Charlie Bit My Finger" sold it as an NFT for £500,000 in May 2021. (Rs 5.15 crore approximately).

The buyer buys NFTs to raise the price at which they can resell collectibles, works of digital art, music, GIFs, popular videos, and other commodities.

Think of a unique artwork you'd like to sell. Auctioning it off is one choice. The actual copy will then be freed from your control, but only if you are actually there at the auction site. But is there a better way to market that work so that you, for instance, receive a small payment each time it is sold?

Selling a duplicate of something is one way to do this. Given that it is not the original copy, it might not be of much service. A Non-Fungible Token, or NFT, can be useful in this situation. The digital art is tokenized after which it becomes a certified original copy.

Think of an NFT as a digital asset's certificate. An NFT also consists of digital software. Simply put, if you utilize an NFT, you might be paid a royalty each time this token (your digital artwork) is transferred.

Even tweets can be bought with NFT. For more than $2.9 million, Twitter co-founder Jack Dorsey, for instance, sold his very first tweet in an NFT format. On exchanges that allow bitcoin for NFT trading, these digital assets can be bought and sold. NFTs have been around since 2014, but their popularity is just now rising.

These digital assets can't be sold easily since NFT has distinctive characteristics. For instance, it might be a Mona Lisa painting. There will only be one original painting available; however, you can download and print the image from the Internet or take a picture of the piece when visiting the Louvre in Paris. Similar to this, you have your own original music, which is unique in the entire world.

You can sell your music for a fair price by offering it as an NFT on the exchange. Any special asset that may be made non-fungible may be certified and sold by an NFT.

NFTs lack a physical form, yet they can be bought and sold on the exchange just like other assets. The two parties involved are the creator of the digital content and the buyer in the trade. These NFTs are currently the digital equivalents of real collectible goods. The purchaser receives a digital file in the form of a token stored in the purchaser's wallet connected to the NFT

exchange rather than a physical picture to put on their wall. The maker and purchaser of NFT Marketplace on WazirX, for instance, both require a decentralized Metamask wallet. It more closely resembles a bitcoin bank account.

The buyer receives ownership rights, which may be granted for a limited period of time or for the rest of their lives, depending on the contract. An NFT can only ever have one owner at any given time.

Each digital asset in NFT has a unique code that is kept on the blockchain. It resembles a ledger since it includes details about the creator and buyers. This code facilitates identifying the NFT's creator (owner).

According to Sandesh Suvarna, the vice president of WazirX NFT Marketplace, "The artist cannot forge digital artworks on the market with blockchain technology since the records are digitally kept."

NFTs published on exchanges include contracts that grant a royalty to the creator (artist) for a lifetime or a specific amount of time, depending on the terms of any potential future sales of the token. For instance, if a producer of a digital asset on the WazirX NFT marketplace demands a 10% fee in the digital art contract, she will keep getting royalties each time the item is sold.

An NFT marketplace designed expressly to handle the blockchain transaction is where NFTs are purchased and traded. Due to the scarcity paradigm, NFTs can range in price from a few dollars to millions of dollars in a digital asset. You need a cryptocurrency and an investing marketplace account in order to purchase NFTs.

The abbreviation for a non-fungible token is NFT. These tokens are electronic representations of actual items, including works of art, audio and visual media, films, and in-game purchases. It is non-fungible since each token is distinct. They've grown to be extremely well-liked by collectors of all stripes, especially those of sports trading cards. They manage the transaction and encrypt the NFT owner's identity using blockchain technology.

Ethereum (ETH-USD) is the cryptocurrency that most NFT marketplaces utilize; although they may also employ other cryptocurrencies including Polygon (MATIC-USD), Solana (SOL-USD), and Polkadot (DOT-USD).

These NFT tokens convert a paper certificate of ownership into a secure, digital format. Even if digital assets are the most common NFTs, some of

them do in fact ensure ownership of special physical assets.

Although NFTs gained enormous popularity during the epidemic, many believe this is a temporary bubble. As an illustration, 30-day sales peaked at $64 million in April 2021 before declining to $832 thousand by March 2022. Spend your money wisely.

Steps to invest in NFTs

These are the steps to invest in NFTs:

- Research available NFTs:

  NFTs, or non-fungible tokens, are unique digital assets that are stored on a blockchain. They have gained popularity in recent years due to their ability to provide proof of ownership and authenticity for digital art, music, videos, and other digital assets.

  You should pick an NFT that you believe has the potential for increased value. The NFT could be a piece of artwork, music, a film, or even anything from a video game. You may look up NFTs on Google or Twitter. An anticipated list of Ethereum and Solana NFTs that will be launched soon can be found on websites like *Rarity.tools* or *NFTcatcher.io*.

  Take note of the sale date, the cryptocurrency requirements, and the quantity of the impending NFTs as you are looking at them. This aids in your comprehension of the choice's limited availability.

  You may want to validate the following regarding the NFT:

- The team behind it:

  You want a recognized group that contributes to increasing the NFT's worth.

- It does not matter if it's off-chain or on-chain:

  Off-chain utilizes centralized servers, which could result in the loss of the image if the server crashes.

- Recommendation: Be wary of NFTs that are entirely off-chain. Make sure the caretaker is someone you can trust with your priceless NFT.

- Join the NFT team’s Discord server to get a greater insight look at their community.

- Select a brokerage or exchange to purchase crypto:

  The coin must then be purchased in order to obtain the NFT. Though there are few exceptions, Ethereum is typically used to purchase NFTs. At a specialist cryptocurrency brokerage or exchange like **Coinbase** (**COIN**), **Robinhood** (**HOOD**), Gemini, Binance.US, or Kraken, you can purchase Ethereum and other cryptocurrencies.

  A business or individual acting as a middleman to facilitate the buying and selling of cryptocurrencies is known as cryptocurrency brokerage.

  Exchange: a website where buyers and sellers can conduct transactions based on the state of the market.

  When purchasing cryptocurrencies, keep in mind that you should take fees into account. For a trade that is $10 or less, Coinbase, for instance, costs $0.99. The larger the trade, the higher the cost. For cryptocurrency trading, SoFi Active Invest charges up to 1.25%.

  A fixed fee per trade or a percentage of an account's 30-day trading volume may apply to fees. Review costs based on the volume of transactions you anticipate making to get a sense of how much you will be spending.

- Select a marketplace to purchase your NFTs:

  The NFT is purchased or sold on the open market. You can register and connect your cryptocurrency wallet once you have found the marketplace where your NFT will be sold. Each market has its own specifications for crypto wallets. Either the product will be sold for a set price, or an auction will be held on an NFT marketplace for the token.

  Popular online markets include:

- OpenSea
- Axie Marketplace
- Larva Labs
- NBA Top Shot Marketplace
- Rarible

  Verify that there is enough cryptocurrency available to complete the transaction, including any applicable fees. Fees may include the price of buying and sending cryptocurrency, converting cryptocurrency, and paying for gas. The money miner receives in exchange for the

processing power used to record transactions on the blockchain is known as gas fees.

Remember that the quoted price or current offer for an NFT does not represent the whole purchasing price. For instance, due to gas fees, the final price of an NFT priced at the equivalent of $40 in Ethereum may reach $150 to $200.

Crypto Wallets

In a crypto wallet on the same blockchain, a different blockchain, or in decentralized storage, the NFT is kept once it has been purchased. The NFT can only be seen on a screen, frequently as part of a website, as it is digital. Even though you are the owner of the NFT, the inventor of the NFT often holds the copyright to the original asset, which prevents you from duplicating it and from bringing a copyright infringement lawsuit against another party.

Examples of NFT Coinbase wallets include:

- Cybavo
- Trust Wallet
- Alpha Wallet
- MetaMask

These wallets enable you to store both your cryptocurrency and the NFTs you buy on the market.

Regulated use of NFTs

In India and other countries, NFTs are regarded as cryptocurrency derivatives. "Traditional regulatory issues with cryptocurrencies are present. Crypto-assets like NFTs would also be prohibited if cryptocurrencies were to be abolished," according to ASQI Advisors' founder Swapnil Pawar.

"The purchase of NFTs is not subject to any legal framework. As a result, they are governed by national contract law," the Forensic and Integrity Services Partner at EY, Mukul Shrivastava, explains.

If you lose money while investing in NFTs due to a fraudulent transaction, you can no longer register a complaint with the Reserve Bank of India (RBI). You'll have to rely on the exchange to solve the issue.

Legal issues, taxation aspects, and more

The buzz surrounding NFTs doesn't appear to be abating any time soon. Non-fungible tokens, in our opinion, are here to stay. However, the rising demand for NFTs is also raising questions about the law and regulations.

Non-fungible tokens are being purchased for tens of thousands or even millions of dollars. The NFT market saw a trading volume of $25 billion in just 2021. Large sums of money are also accompanied by fraud and scams.

Todd Kramer, an art collector and gallerist, lost NFTs worth $2.2 million in 2021 due to a hacker. Numerous concerns have been raised about the cybersecurity threat posed by NFTs as well as the necessity of regulatory frameworks as a result of this and similar occurrences.

NFTs are irreplaceable, distinctive digital assets that keep track of their unique identifiers on smart contracts.

Non-fungible tokens, which are based on blockchain technology, guarantee transparency and greater security. They also enable authors to demonstrate their ownership of their creations. Because of this, more and more digital artists, galleries, and museums are starting to adopt NFTs.

Furthermore, the NFT boom occurred in 2021. In order to monetize their brands, a lot of sportsmen, gamers, investors, and company owners followed the trend.

Introduce yourself to the most intriguing NFT application cases before delving into regulatory issues. Check out the video as follows to see several examples of deploying NFTs in the real world across many businesses. It was provided by our blockchain consultant.

NFT regulatory challenges and concerns

Digital assets' rising prominence has given rise to a number of legal issues. The lack of a developed NFT regulatory framework is the fundamental issue.

There is still disagreement over how to handle NFTs, which makes it difficult to set clear regulatory norms.

NFTs can now be seen in one of three ways: as goods, securities, or intellectual property. Let's explore each interpretation in more detail.

NFTs as commodities

Commodities are defined by US law as reasonably interchangeable services, goods, and rights, including money and interest rates, that are traded as commercial articles.

The **Commodity Futures Trading Commission** (**CFTC**) asserts that cryptocurrencies like Bitcoin and Ether, as well as renewable energy credits and other intangible assets, are included in the definition of a commodity.

If we take NFTs, they resemble cryptocurrencies in several ways. They may be bought and sold and are based on blockchain technology. In addition, the CFTC places more of an emphasis on price manipulation and commodities exchanges than it does on underlying assets and issuers.

The **Commodity Exchange Act** (**CEA**) may be implemented if it is decided that NFTs should be classified as commodities. In this situation, NFT transactions may be subject to CEA laws on manipulative trading.

NFTs as securities

Securities are a different kind of NFT that is possible. NFTs must, however, satisfy the Howey Test in order for this to be the case, as it serves as the foundation for classifying an asset as a security.

According to the Howey Test, security is an investment in money that is anticipated to generate benefits as a result of other people's labor. For instance, if you purchase Google shares, you anticipate making money off Google's future endeavors.

Let's say you buy an NFT from a well-known musician like Beeple. It might increase in value based on how well-known the artist is, but it won't make you money because of other people's labor. Beeple's NFT won't pass the Howey Test as a result.

However, fractional NFTs (also known as F-NFTs), in which an investor shares a portion of an NFT with others, may be regarded as "investment contracts" under the Howey Test.

The Securities Act of 1993 and the Security Exchange Act of 1934 must be applied if NFTs are deemed to be securities. In this approach, all markets would be rigorously regulated and only authorized brokers and exchanges will be able to trade NFTs.

NFTs as intellectual properties

Intellectual property is another category for NFTs. By tokenizing their assets, people may make sure that the original asset is linked to just one person thanks to NFTs.

However, as non-fungible tokens can be used to represent ownership of a work or patent, this could lead to issues and concerns over intellectual property.

It is true that many NFTs contain smart contract language defining intellectual property phrases. But because NFTs cannot stop the replication and commercialization of the underlying asset, the enforcement of these terms forces us to consider legal frameworks once more.

In brief, before issuing their NFTs, creators, and issuers are recommended to confirm that they hold the necessary intellectual property rights.

Let us use our expertise in Ethereum programming to change your company.

You should be aware of the NFT taxes issues.

Non-fungible tokens are subject to tax rules, just like stocks or bonds, therefore any profits you make from selling NFTs will be subject to taxation. The typical actions that would typically result in taxes are listed as follows:

- **Acquiring a good with fungible cryptocurrency: If you use Ether (ETH) to purchase a collector** card at OpenSea, you will have made a capital gain and must pay taxes on it.
- Offering a crypto NFT: A capital gain or loss may also be the result of this activity. For instance, let's say you paid $50,000 for a token that you later sold for $55,000 BTC. It implies that you will make a $5,000 profit (and therefore be liable to tax).
- Exchange of one NFT for another. A $1,000 capital gain would be taxable if you purchased a token for $5,000 in BTC and later exchanged it for another token at $6,000 in value.

However, if you merely create a token, that won't be seen as a taxable action. Rarible and OpenSea are two markets that have their own NFT taxation policies. You must pay taxes on any profit you make through NFT trading because it is considered personal income. Income tax rates typically range from 10% to 37%. You'll also need to pay 15% self-employment taxes on

your profit.

Generally speaking, laws and regulations relating to NFT taxation vary by nation.

For example, in the US in 2021, President Joe Biden signed the Infrastructure Law, according to which all brokers, such as Coinbase, must record transactions, tracking them for both the customers and **Internal Revenue Service** (**IRS**). Additionally, businesses that receive cryptocurrency payments exceeding $10,000 must disclose the sender's identity to the government.

Anyone who owns crypto assets and makes a profit from them is subject to **Capital Gains Tax** (**CGT**) in the UK. This implies that you must pay taxes on the difference between the price you received when you sold your bitcoin and its purchase price. Only gains that exceed your annual exempt amount or your total tax-free allowance must be paid as CGT.

There are no explicit laws governing the taxation of NFTs in Hong Kong. When determining the taxability of income derived from digital assets, the **Inland Revenue Department** (**IRD**) typically applies regulations and standards used in a traditional company.

The **Australian Taxation Office** (**ATO**) published guidelines for NFT taxation in Australia. This suggests that the tax treatment of non-fungible tokens is dependent on factors, including user circumstances, how they utilize the NFT and the motivations for their holding and use in transactions.

We advise you to investigate your local rules and regulations before engaging in NFT sales in light of these regional and global variations in taxing NFTs.

Current NFT regulation laws and standards

Non-fungible tokens have sparked a number of inquiries about NFT regulation, including whether or not they are covered by state laws controlling virtual currency and anti-money laundering regulations.

Let us go through these points in more depth.

NFTs are governed by anti-money laundering regulations

A majority of nations have only recently begun drafting legislation to address the problems with NFTs' money laundering. In fact, these new laws and their expansion into existing ones were a result of NFTs.

The Anti-Money Laundering Act, passed by the US Congress in 2021, was created to control the behavior of financial organizations. However, the Act broadens the scope of financial institutions by adding companies that deal with the medium of exchange that acts as a substitute for currency, even if it doesn't directly set down requirements for NFTs. This is pertinent to NFTs in particular and cryptocurrencies in general.

Additionally, the Office of Foreign Assets Controls (OFAC) has not made any specific recommendations on NFT standards. However, they asserted that digital transactions are subject to US sanctions in the same manner as physical ones.

The National Defense Authorization Act also received some anti-money laundering provisions from the US government (NDAA). Updates to some anti-money laundering laws, like the **Corporate Transparency Act** (**CTA**) and **Anti-Money Laundering Act** (**AMLA**), are included in these. The Bank Secrecy Act was broadened by the AMLA to cover all art traders (consultants, advisors, sellers, and so on).

In that, they haven't created anti-money laundering legislation specifically for NFTs, the EU's approach to NFTs and money laundering is comparable. However, the Markets in Crypto assets Regulation was enacted by the European Commission in 2021. (the MiCA Proposal). A legislative plan for regulating crypto assets is part of this package of digital financial services.

In addition to providing a definition of a crypto asset for the first time in the EU, MiCA includes regulations that would be applied to NFTs. Its major objective is to simplify blockchain technology and EU regulation of virtual assets.

State laws governing virtual currency apply to NFTs

The position with virtual currency appears to be essentially analogous to the state of play with anti-money laundering, despite the fact that governments have not yet released any specific instructions about NFTs. Nevertheless, a few US states have passed laws regulating the operation of companies that deal in virtual currency.

For instance, New York has a list of activities that require businesses involved in these activities to acquire a license and post surety bonds or fund an account, all of which help protect clients. These activities include exchanging, transferring, administering, and issuing virtual money.

NFTs and consumer law

Non-fungible tokens typically fall under local consumer regulations because they are sold to the general public rather than just professionals.

The consumer law mandates that NFTs operate with a high level of transparency and adhere to consumer protection laws, including the right of customers to obtain pertinent information about NFTs in their native tongue and to have the sale of non-fungible tokens governed by local law, among other things.

Quoth is a cross-chain platform that enables users to build custom NFTs.

Legal concerns with NFT that you should be aware of

As discussed earlier, the legal system and NFT standards were not created to support these digital assets. However, even as NFT investors, buyers, and sellers investigate this area, new NFT legal difficulties keep cropping up.

Cybersecurity dangers and challenges with intellectual property rights during NFT sales.

NFTs and intellectual property rights

You should be aware that the NFT seller has the intellectual property rights if you want to buy NFTs.

When a content creator is the issuer of an NFT, they are deemed to be the owner of the intellectual property rights of that NFT and are free to provide the buyer with the right to use, copy, or alter the content.

If an issuer buys content directly from the creator, they will only have the rights that the creator gave them. They will only be able to transfer these few rights to the buyer when selling an NFT.

Make sure the NFT you buy contains metadata indicating the relevant assets to which they are tied, such as token ID or original inventor, to prevent

purchasing illegitimate digital assets. You may verify who really owns the underlying asset by doing this.

Also keep in mind that when you buy an NFT, you are not buying the underlying piece of art or all the rights that go with it. Instead, you are purchasing the work's related metadata (this is not the same as the work itself). Your purchase ensures that you have the exclusive right to acquire this NFT, but nothing else.

Let us take look at an actual example to understand how this all functions. In the conditions of sale, the Valuables platform, which Jack Dorsey used to sell his tweet, stated that the transaction was "an autographed certificate of the tweet" and that the copyright in the tweet was not transferred to the buyer.

Because Dorsey still owns all the copyrights to the tweet, even after paying $2,9 million for the NFT purchase, the buyer will not be able to utilize the tweet itself (such as printing it on a shirt) without Dorsey's consent. Only if Dorsey gives the NFT buyer access to those intellectual property rights can the tweet be used.

NFT copyright infringement lawsuits are now appearing in courtrooms more frequently. The **Roc-A-Fella Records** (**RAF**, Inc.) case illustrates an early case. Shawn Carter (Jay-Z), Dame Dash (Dash), and Kareem Burke established RAF Inc. All the trio's recordings, including the album Reasonable Doubt, belonged to RAF Inc. The group's economic links were severed in 2005, yet each member still owned a third of RAF Inc. In January 2022, rapper Lil Yachty filed a lawsuit in California federal court against NFT seller Opulus AFTER Opulus advertised the ‘Lil Yachty NFT Collection’ on its website.

Dash issued an NFT for the Reasonable Doubt album in 2021 with the promise that it would demonstrate ownership of the album's copyright and transfer ownership of all future album sales to the NFT holder.

Dash technically does not have direct ownership of the album because he is a shareholder. In order to prevent Dash from auctioning the NFT, RAF Inc. filed a complaint in response to this conduct. The court ruled in favor of RAF Inc. and prohibited Dash from reselling, duplicating, or otherwise using the album.

Similar instances will probably keep coming up in court, which will assist develop the framework for non-fungible token legislation.

The risk to cybersecurity is increased by NFTs

NFT frauds and account takeover are the most prevalent cybersecurity risks raised by the expanding popularity of NFTs, particularly the simplicity of their production and selling. Let's look more closely.

Fake NFT selling and plagiarism

False NFT selling entails using the internet to promote an item without owning the intellectual property rights to it. Additionally, it may entail selling replicas of well-known works and passing them off as originals.

For instance, Aja Trier, a well-known painter known for creating canine-themed interpretations of Van Gogh's Starry Night, recently announced that she had discovered 86,000 NFTs based on photos of her work. Trier also discovered that until OpenSea removed the false listing, at least 37 NFTs based on her stolen works had been bought on the website. And none of that money was given back to the artist.

Governments have thankfully begun to take action to stop such actions. A continuing scam involving NFT sales, for instance, was recently charged by the US Attorney for the Southern District of New York against two defendants.

The defendants were charged with using various social media platforms to advertise fake NFTs. One offence of wire fraud and one count of conspiracy to commit money laundering were brought against each defendant. The maximum sentence for each crime is 20 years in jail.

One of the first criminal cases involving NFTs, it is hoped that it would prompt increased regulatory examination of these digital assets.

Takeover of an account

For owners of NFT, account takeover is another source of suffering. It gives cyber criminals access to NFTs that don't belong to them and allows them to manage and sell such NFTs.

The Nifty Gateway NFT marketplace, for instance, disclosed in March 2021 that some of its user accounts that didn't activate two-factor authentication had been compromised. A number of the NFTs, according to the victims, were afterwards sold again.

It is essential that NFT marketplaces review their administrative and technical safeguards in order to prevent scenarios like this one. Additionally, users should take some preventative actions, such as turning on two-factor authentication for their accounts.

Are NFTs a wise investment?

As we have seen, there are risks associated with investing in NFT. Furthermore, the situation is made worse by the lack of a real regulatory structure.

Non-fungible tokens simultaneously provide a number of benefits to all participants. For both NFT developers and investors, the absence of middlemen and associated commissions in NFT trading is a significant advantage.

Additionally, by making an investment in a promising NFT enterprise, you can later resell your NFTs and make significant returns. Think about the Reflection NFT via XCOPY as an illustration. The artwork was initially sold for $98,500, and two weeks later, it was resold at the SuperRare marketplace for $872,500.

As a result, if you're thinking about investing in the NFT market, we advise you to start small and carefully research the project you're interested in. This situation is compatible with the old investing tenet of "buy low and sell high."

As we can see, the market for NFTs is still growing, and it will take some time until an appropriate regulatory framework for NFTs is put in place. Having said that, governments all over the world have already begun the process of developing NFT norms and standards, proving that they are seriously interested in these digital assets.

Additionally, you should be aware that the phenomenal success of NFTs will undoubtedly result in fraudulent activities. For this reason, it is becoming more and more crucial to conduct your own research before purchasing or investing in NFT collections or projects.

Factors determining market prices

The cost of an NFT is decided through an auction or at a predefined cost established by the inventor. Creators have complete control over the pricing strategies they use on global NFT exchanges like OpenSea. NFT is only

available on the WazirX online marketplace in India. It enables the exchange to sell NFT at a predetermined price.

Feasible to invest in NFT using Indian rupees

No. It is not feasible to invest in NFTs with INR money. On NFT exchanges, cryptocurrency transactions are required. For instance, WazirX only allows WRX cryptocurrency to be used to invest in NFT. Before making a purchase in a certain NFT, the consumer must first convert INR into WRX cryptocurrency in their digital wallet.

Setting market price

The cost of an NFT is decided through an auction or at a predefined cost established by the inventor. Creators have complete control over the pricing strategies they use on global NFT exchanges like OpenSea. NFT is only available on the WazirX online marketplace in India. It enables the exchange to sell NFT at a predetermined price.

Purchasing NFTs a bubble

When a well-known or emerging musician is acquired for several million dollars, even legitimate NFTs receive a boost on the markets. Pawar, on the other hand, asserts that "it is a complete scam" and that "there is nothing underpinning and purchasers (investors) are just speculating for the sake of speculating"

I doubt that people would engage in NFTs in the same way since they perceive it as an indirect kind of gambling for quick profits. Investing in NFTs, like GameStop or AMC entertainment holding businesses listed on the Nasdaq stock exchange, may or may not become a craze. Therefore, one should exercise caution and research the market before buying, advises Rishabh Parakh, a chartered accountant and founder of NRP Capitals.

Investing in NFTs

NFTs have been incredibly well-liked throughout the epidemic, leading many investors to wonder how to get their hands on them. The pixelated artwork by Beeple, the first tweet by Twitter (NYSE: TWTR) CEO Jack Dorsey, and the CryptoPunks characters have all been sold at auction as NFTs for millions of dollars.

Artists, collectors, and speculators have flocked to the movement as the value

of cryptocurrencies and other digital assets have increased. Whether this is the beginning of a new long-term investment asset class or an unsustainable bubble about to burst, the jury is yet out. NFTs, however, appear promising for artists and can be applied commercially.

NFT investing strategies

Right now, non-fungible tokens are all the rage in the digital world. Everyone is interested in trying out NFTs to see what all the hoopla is about. A commerce revolution occurred as a result of the online community. Owning NFTs is now a common habit; it is well-liked in the community and popular, but it also gives people a great opportunity to invest in and perceive NFTs as assets.

Investing in NFTs is a wise move

NFTs are making waves in the digital world. Finding someone who hasn't heard of this incredible site is difficult. Due to their tremendous popularity, NFTs are frequently purchased and sold by the bulk of the online community. NFTs are a reasonably risk-free investment option; nonetheless, the return is luck- and asset-life dependent. NFT investors have experienced some poor luck. Long-term, though, it is a profitable investment.

Five investment strategies used by NFT

In order to process a safe and secure investment, the NFT investing guide includes numerous NFT investment approaches:

- NFT makes a digital art investment

  NFTs have become more common due to their ability to trade digital artworks online. This technological advancement guarantees the ownership of digital art on the blockchain network and enables its exchange. Digital audiences buy and sell digital artworks as NFTs for a variety of reasons, but the capacity to protect ownership is the most crucial. When you take into account the benefits of NFTs, purchasing digital art is a fantastic decision.

  NFTs' predecessors and digital artworks are the most commonly traded items in any marketplace. Due to their accessibility, investing in them is

a great solution for NFT investors. Buying a single NFT artwork or several NFT works from the same collection enables investors to sell those NFT assets later on when their market value increases.

- Investing in Real Estate Using NFT

  The real estate sector is very large and involves a lot of high-volume commerce. The concept of ownership is the most important element in any trading domain. It is quite challenging to transfer ownership in the real estate sector. Because of the involvement of middlemen like banks, financial institutions, and central governments, this is the situation. The transfer of ownership has consequently grown more contentious. NFTs are the solution to this issue. By converting the legal documents from the real estate platform into NFTs, it assures asset ownership. This makes it a much safer investment than one in centralized real estate.

  It is therefore expected to be a top-tier investment choice for individuals looking for a home run.

- Investing in NFT Games

  The most popular trend right now in the digital realm is NFT games. In today's digital environment, the idea of "play to earn" has changed how games are played. The blockchain industry's most well-liked domain is the one that allows gamers to earn money while participating in games. For investors, the NFT games have developed into the perfect investing platform. Other cutting-edge techniques like yield pooling and staking are also presented.

- Investment in the NFT Marketplace

  Any NFTs that must be traded, bought, or sold must do so through the NFT market. A special platform created on the Ethereum blockchain is known as an NFT marketplace. This platform launches all NFT trading and secures every transaction detail using the power of blockchain. The NFT sector has developed into a tremendous economic opportunity for entrepreneurs. It has developed into a key area of adoption and investment for businesses. Putting money into an NFT marketplace and developing a distinctive platform draws a sizable audience. Money is made through charging listing fees, minting fees, auction fees, and numerous other fees. As a result, having earnings and income appear quickly is a great NFT investment strategy.

- NFT Marketing

  Due to its ability to draw a huge number of people, NFT marketing is a wonderful marketing investment; it also makes a great NFT investment. NFT marketing is a unique way to promote the platform actively in order to draw in new members. There are many NFT marketing options, including social media marketing, email marketing, content marketing, promotion, and more. By making investments in these kinds of NFT investment strategies, it is possible to earn significant income and profits in the future.

Make money with NFT

For everyone, NFTs have created a world of opportunities. Transforming one's labor into an asset that generates income requires a lot of skill. The possibility of this arises from NFTs. Anyone can make money off of their creation thanks to NFTs, whether it's through music, painting, movies, trading cards, or anything else. Due to the fact that they monetize work, NFTs are distinct and remarkable. NFTs are also stored on a blockchain, where ownership is protected, and every time a sold NFT is traded again, the original owner is rewarded. As a result, NFTs are wildly popular and a fantastic method to make money in a secure environment.

Non-fungible tokens are currently at the top of the digital success ladder. It has developed into a superb investing platform, and in the future, it is predicted to reach new heights. Thanks to the possibilities of blockchain and NFT, the digital world has developed into an excellent investing space for cryptocurrency enthusiasts, enterprises, and organizations.

Top 7 NFT trading strategies

NFT collections are currently regarded as a successful business because of their high value. Before investing in them, it's critical to develop a trading strategy that will enable you to realize substantial returns.

It's time to consider NFT trading methods now that the basics are clear. You need to properly plan your NFT acquisitions regardless of whether you're hoping to flip the property quickly or keep it as an investment for the long term.

Whether you are a newbie investor or an expert trader, we have investigated

some of the most helpful NFT trading methods and included them in this book to help you develop your trading abilities.

Any commodity or asset trade should result in a gain. However, the potential gains could be reduced if the trader does not employ the proper trading techniques.

A successful NFT trading strategy should keep you focused on the market, aid in your evaluation of recent and previous deals, and eventually direct you toward making the finest NFT investments.

The top seven trading NFT strategies are:

- Purchase at the BAYC floor price using NFT trading strategies: *OpenSea*

  There is a good likelihood that NFTs will continue to exist for many more years as the market for them continues to grow in popularity. Because of this, novice investors ought to think about buying NFTs at the floor price.

  You'll probably want to know how much the floor costs and how to purchase it.

  The least expensive price for a non-fungible token is the NFT market floor price. The lowest NFT advertised for sale, which would be the floor price, can be found by sorting the NFT items from a certain collection by price. However, not all inexpensive NFTs assure a profit. You should always choose an NFT project based on your interests because of this. The best thing you could do is follow the project before it is launched to ensure you'll receive the best price for an NFT collectible.

  Remember that buying it at the floor price is usually a smart NFT trading strategy since, if the token gains popularity, you can sell it for a healthy profit.

  Simply put, buying the floors will give you a seat on the token's upward growth trajectory.

- Lookup Google trends:

  Regardless of your inexperience in the NFT market, you may easily tell if a specific NFT market is still hot by checking the most recent Google trend or websites such as **https://www.decemeve.io/** to search the NFT

with a specific word. This will resemble marketing research more. But the reason for it is simple: that's what it is. And what better place to ask this question than the search engine that everyone uses to browse the web?

A superb free resource that provides excellent insights into the general public's perception of a topic or term is Google Trends. Ratings for word searches range from 0 to 100. A high grade suggests that NFT collectibles are appealing to consumers. It also suggests that now is a good time to buy subtly.

If the number of searches for NFT-related terms decreases, you must exercise caution. Fewer people are interested in the market as a result.

However, you should be aware that, just like NFT initiatives, trends can swiftly gain or lose favor. Traders are drawn to enterprises that are well publicized, but they can easily depart if trade volume declines.

Try to track and compare market trends with the project's trade volume for better outcomes. A project with many traders is more likely to be healthy than one with a small number of merchants, thus it is also crucial to keep track of this number.

- Purchase NFTs collectibles from a select few merchants:

  Any NFT investment that yields a profit assumes that you will be able to sell it for more money than you paid for it. Naturally, it will be more challenging to market an NFT without a sizable community that is eager to support the initiative.

  The number of sellers for a certain NFT collection should constantly influence your trading techniques. You need to have a significant enough trading volume to close a trade if you want to sell. The challenge of maintaining competitive prices grows as the number of sellers rises. This is so that more individuals than you will drop their prices.

  Consider the way sellers respond while considering them for an NFT. The vendors must have the patience to wait for the ideal bidder if the prices stated are distant from one another. If you offer a lesser price, they're not going to likely react.

  The vendors are rushing to undercut if there are numerous prices that are near to one another, nevertheless. Selling NFTs is a struggle for the

dollars of the consumer. Selling NFTs to patient buyers will increase your chances of success.

They will respond in a manner that is substantially influenced by market trends and seller behavior. Please take note that this NFT trading method trend is subject to change. When you are comparing similar NFTs collections, this approach works best.

- Value planning:

  The NFT value strategy emphasizes buying expensive NFTs. It's important to note that if you're just getting started and your budget won't support it, this may not be the greatest trading technique for you.

  To find valuable NFTs, you'll need to use online NFT tools like rarity.tool. It is one of the most often used tools for comparing the rarity of various NFT projects.

  For instance, *CryptoPunks* is one of the NFT collections that commands high pricing due to its reputation as a special NFT collection.

  The demand for rare NFT collectibles will always outpace the supply, which gives them a better chance of rising in value over time.

- Use NFT trading strategies that buy the ceiling:

  Consider buying the ceiling as your NFT trading technique if you're willing to stake a significant amount of money in the NFT market.

  If you have the funds to invest in NFTs, the ceiling or top is a fantastic choice because these assets are uncommon and in high demand. This implies that if there is greater demand for the project, the cost of ceiling NFTs can increase. In the marketplace, where people can shop by price, these products are also well-liked. They might be advertised as the project's greatest NFTs in various locations.

  The disadvantage of this specific NFT trading approach is that fewer people have the money to buy NFT. Finding someone willing to sell at a fair price is tough as a result. If the project loses support, ceiling traders could incur significant losses. This is a play with a high risk/high reward ratio for people with sizable bankrolls.

- Search for discounted NFTs:

  Any novice NFT investor's ambition is to discover an underpriced NFT on the market. This approach is independent of market trends and is

effective even when there is minimal interest in a particular NFT collection.

You must locate NFTs that are now being sold for less than they were purchased for in order to apply this NFT trading approach to profit.

For instance, five identical NFTs can be advertised for $300. The rest of the collection is also advertised for over $600 at the same time. Although this appears to be a fantastic deal, you might want to check out the less expensive NFTs in this set. Don't rule out the idea that those NFTs cost just $50 each to purchase. That makes the $300 listed price on their website excessive. The lesson here is not to evaluate an NFT's worth solely on the basis of its current listing price.

Market pricing is vital to take into account, but it should not be your sole consideration. You can assume that the NFT value has increased if the project's market has improved overall.

- The NFT project market:

  Club of Bored Apes (BAYC)

  This is arguably the most significant NFT investing factor and a key supporter of your NFT trading techniques. Always consider whether there is a market for the NFT project you want to fund.

  You shouldn't put too many eggs in one basket if the community is small and there are no plans for a marketing effort. The best course of action would probably be to stay away entirely.

  Daily new projects are added to the NFT marketplaces. The people who can sort through all of those projects and identify the ones with a purpose are the successful NFT investors, though. Look for NFT initiatives that are useful and, most importantly, have a welcoming community. Find communities that are sizable enough to support potential NFT customers.

  Finally, to take it up a step and help enhance its selling value, you could even want to get involved and promote those NFTs. Participate in local affairs. To make things easier for the new prospective purchasers and art collectors, identify the project's pain points and offer to assist.

Profit in NFT investments

NFTs are worthwhile investments since they will be the most appropriate ones after digital investments in 2022. The NFT market will unquestionably expand more in 2022. There are more projects popping up now than there were in the previous NFT initiatives, and they offer more functionality.

However, if you want to fully understand the most recent advancements, you must be a part of the NFT community. The community will provide details on what is necessary to generate interest in a given NFT in response.

Using NFT trading strategies

There is no perfect NFT trading method that can provide enormous returns; instead, each investor must consider their financial resources and choose a trading strategy that fits them.

Nevertheless, it is critical to have reasonable expectations and to avoid getting discouraged when an NFT project does not sell for the anticipated sum. These initiatives mainly rely on consumer trends and marketing initiatives. Whatever the chosen NFT trading tactics, you should always take the status of the market into consideration.

Conclusion

In this chapter, we explained how to invest in NFTs, as well as how NFTs and cryptocurrencies vary from one another.

Even though it makes it logical to combine cryptocurrencies and NFTs, they are not the same things. NFTs and other cryptocurrencies like Bitcoin and Ether employ the same blockchain technology, which is the source of this.

Unlike cryptocurrencies, which have an inherent worth in terms of money, NFTs represent a variety of things with different monetary values (such as art, songs, property, and so on.).

As a result, they are not economically fungible, as opposed to cryptocurrencies like BTC and ETH (can be traded and has innate value).

NFTs are much safer than a certificate of authenticity because they are nothing more than a representation of a real or virtual object. As a result, the word "token" in "non-fungible token" is important.

Finally, we covered topics like whether NFTs are considered a form of cryptocurrency, how to invest in NFTs, and NFT investment methods.

In the next chapter, we will learn about different NFT marketplaces.

Key terms

- **Crypto wallet:** Your private keys are kept safe and accessible by crypto wallets. You may transmit, receive, and spend cryptocurrencies like Bitcoin and Ethereum using them as well.
- **Ethereum (ETH-USD):** Cryptocurrency that most NFT marketplaces utilize.
- **NFT Marketing:** It enables producers and companies to successfully market their NFT assets to attract more customers and investors to their network.

Multiple Choice Questions

1. **Distinctive features of NFTs are:**
    a. Indivisibility
    b. Indestructibility
    c. Provenance
    d. All of the above
2. **The buyer buys NFTs to _____ the price at which they can resell collectibles, works of digital art, and music.**
    a. raise
    b. decrease
    c. hamper
    d. copy
3. **The following are the cryptocurrencies:**
    a. Polygon (MATIC-USD)
    b. Solana (SOL-USD)
    c. Polkadot (DOT-USD)
    d. All of the above
4. **The Bank Secrecy Act was broadened by the AMLA to cover:**
    a. Consultants

b. Advisors
c. Sellers
d. All of the above

5. **NFT is only available on the _____online marketplace in India. It enables the exchange to sell NFT at a predetermined price.**
    a. WazirX
    b. WazirY
    c. WazirA
    d. WazirB

Answers

1. **d**
2. **a**
3. **d**
4. **d**
5. **a**

Join our book's Discord space

Join the book's Discord Workspace for Latest updates, Offers, Tech happenings around the world, New Release and Sessions with the Authors:

https://discord.bpbonline.com

CHAPTER 6

NFTs Marketplaces

Is it a good idea to invest in NFTs as discussed in the previous chapter? It is not a good idea to purchase an asset just because it has been tokenized into an NFT. NFTs are not investments in and of themselves, thus before purchasing an NFT, make sure you are aware of the value of the underlying asset.

A "non-fungible token" is a token that is not transferable among other tokens. There are no further similarities with digital currencies like Bitcoin or Ethereum; instead, the programming is usually distinct.

Physical money and cryptocurrencies are both "fungible," which means they can be exchanged for one another. They both have equal value because a dollar is always worth another dollar and a bitcoin is always worth another bitcoin. Cryptocurrency provides a safe mechanism to carry out blockchain transactions due to its fungibility.

Unlike other materials, NFTs are unique. Since they are all digitally signed, it is difficult to trade or compare NFTs between them (hence, non-fungible). Even though they are both NFTs, one NBA Top Shot video isn't the same every day.

You will learn about the NFTs market in this chapter. An NFT marketplace is your passport to purchasing and selling digital items, including music, art, and entire virtual worlds, if you want to join the NFT craze. Think of NFT markets as the digital equivalent of Amazon.

There are numerous NFT markets, many of which serve a particular industry or niche. Before deciding which NFT marketplace to use and which ones are the finest, what should you check for? Here is all the information you require.

We'll discuss the various NFTs marketplaces in detail.

Structure

In this chapter, we will cover the following topics:

- Introduction to NFTs marketplaces
- OpenSea
- Rarible
- AtomicMarket
- NBA Top Shot
- Nifty gateway
- SuperRare
- Alcor NFT/Alcor Exchange
- Wax (Atomic hub)
- Foundation
- VeVe
- Crypto.com
- Magic Eden
- Binance
- Tips for selecting NFTs

Objectives

After studying this chapter, you should be able to know the various NFTs marketplaces, how to invest in NFTs, and the tips to select NFTs Marketplaces.

Introduction to NFTs Marketplaces

Non-fungible tokens are tokens that are not transferable between parties (NFTs). They are unique items that are incomparable to anything else. A unique trading card, for instance, is an NFT since it cannot be exchanged for another card. When you exchange your card for another card, you receive something different. These are not interchangeable fungible objects, which are different. You will be in the same situation as when you started if you swap one bitcoin for another. On the other hand, if you trade a T206 Honus Wagner card; which is from 1909 American Tobacco Company and is worth over $1 million; for a largely pointless mass-produced baseball card from the late 1980s, you've done well for yourself.

Today, the vast majority of NFTs are digital. This makes it especially simple for authors to provide their audience with something unique and exceptional. For instance, some NFTs are digital artworks, which are being gathered in the same manner that people have long gathered real paintings. And some of these NFTs have sold for enormous sums of money. A digital artist named Beeple's NFT piece was auctioned at Christie's for $69 million. *Figure 6.1* shows NFTs Marketplaces:

Figure 6.1: *NFTs Marketplaces*

A more usable variation of a contemporary digital NFT is CryptoKitties. In this game on the Ethereum blockchain, users may buy, sell, and breed virtual "cats." Just like your real-life pet, every "cat" is unique.

With the exception of the fact that they are non-fungible and non-divisible, NFTs share several characteristics with Bitcoin and other cryptocurrencies. The first-generation NFTs were a component of the Ethereum blockchain, which also contains electrical information that helps separate them from one another. Other blockchains now allow NFTs as well. Not all NFT exchanges buy and sell every type of NFT since different NFTs use various blockchain technologies. Creators commonly select NFT marketplaces based on whether or not they support a certain NFC token standard. The two Ethereum standards that have been created thus far are ERC-721 and ERC-1155.

Competitor Binance later created the BEP-721 and BEP-1155 specifications. The two "1155" standards are distinct from the original "721" standards because they allow several N to be bundled and traded simultaneously.

Most NFT platforms demand that users have a digital wallet and use cryptocurrencies to complete their transactions.

NFTs Marketplaces

Online marketplaces for purchasing, trading, and minting NFTs are known as NFT markets. They should be your first stop if you want to buy or sell NFTs.

A huge online storefront where customers can browse the products and make purchases might be used to describe NFT marketplaces. The great majority of NFT marketplaces will need consumers to have a cryptocurrency wallet in order to store their NFTs once they have been purchased because NFTs are stored on the blockchain.

Listed assets on NFT markets are often priced in digital currencies, with Ethereum being the most widely used. When NFTs are purchased, the seller gives the buyer ownership while paying a network transaction fee. *Figure 6.2* shows the Binance NFTs Marketplaces:

Figure 6.2: *Binance NFTs Marketplaces*

New NFT markets are continually developing and competing for a particular

market "niche" as a result of NFTs' phenomenal surge in popularity. The NFT marketplace, or market for Non-fungible tokens, acts as a public blockchain platform. Despite being young, this platform is gaining popularity and inspiring businesses and developers to establish a marketplace.

Online markets for digital assets have recently gained a lot of attention around the globe. However, building your own marketplace is unquestionably necessary if you want to compete in the digital market. Cryptocurrency trading and blockchain technology are no longer esoteric ideas, and many people sell goods on multiple exchanges.

It is a platform that simplifies the process of buying and selling NFTs. These tokens can typically be purchased or sold for a predetermined price. To use an NFT marketplace, you'll need a cryptocurrency wallet where you can keep and trade your best NFT tokens. To sell their wares on the marketplace, users must first create an account, upload their digital works, and then log in. Because they provide everything a client would need, including proficiency in promoting online artwork and a focus on certain target groups, specialized marketplaces tend to be more popular than standard ones.

NFT Marketplace features

Before we can understand how to create an NFT marketplace, it is essential to have a thorough understanding of how an NFT marketplace functions from a client's perspective. The procedure is actually the same on all NFT platforms. NFTs for instance, is a platform for trading Non-fungible tokens. On NFTically, setting up a store merely takes a few minutes. The main significance of the NFT marketplace is the NFT Auction. *Figure 6.3* illustrates the characteristics of the NFTs market:

Figure 6.3: *Features NFTs Marketplaces*

The features of the NFTs Marketplaces are as follows:

- Users must register on the platform before they may log in. After creating an account, they can download a digital wallet to store their NFTs.
- Users can display their assets and showcase their work by adding goods to their profiles. Users can also decide which payment tokens they want to receive and set their own fees if the platform supports it.
- Putting the goods up for sale on the market is the following stage. Users can choose to participate in an auction or bid on a fixed price. A transaction that initiates a private transaction smart contract is created in the user's wallet when they sell an item. Prior to including the NFT on the list, the platform must reconcile the data.
- Smart contracts, a form of a transaction protocol, are implemented in the NFT marketplace. These regulations regulate the interactions between the vendor and the customer. These smart contracts also provide NFT-specific identification information. Token sales and

purchases thereby become easier and more convenient.

Important spots in the NFT marketplace

NFT marketplaces can be helpful in a variety of different contexts outside those involving art. The following regions make up the NFTs market:

- Digital Art

  Different forms of digital art are used by many NFTs to boost their bottom lines. Whether it's digital reproductions of actual images or memes, everyone can find something they like.

  On the NFTically platform, for instance, you can buy, sell, and send music, films, GIFs, and photographs. The platform uses the ERC721 and ERC1155 protocols to create NFTs, and it is built on Ethereum. *Figure 6.4* illustrates key locations in the NFTs market:

Figure 6.4: *Important spots in NFTs Marketplaces*

- Swapping

  On the NFT exchange, you can trade virtual worlds (Metaverses), real estate (Mintable), collectibles (NBA Top Shot), cartoon characters

(CryptoKitties), business prospects, and anything else whose ownership can be represented by tokens.

- E-learning services

  These online stores should provide a variety of e-learning offerings. This includes selling complete courses, keeping track of students' progress, and communicating with professors.

  NFTs for video games, which serve as substitutes for a range of in-game items and characters, are frequently bought and sold within the game itself or through reputable third-party platforms like Steam. This necessitates a strong bond with the game.

- Security

  Required tokens contain keys for a variety of data types, programmes, databases, operating systems, and events. To effectively market NFTs, the platform must prioritize security and include Touch ID, Face ID, and Eye ID features.

- Investments in projects

  For the trade of assets, these NFT trading platforms should operate similarly to stock exchanges. In addition to issuing property rights, dividends, and shares, they must also be able to do so.

Important specifications to look for in an NFT Marketplace

When looking for an NFT marketplace app, pay close attention to the following significant factors:

- Shopfront

  A shopfront or storefront that functions as a dashboard is expected in a healthy NFT market. Customers can obtain all the asset-related information they need, such as owner, title, price description, archives, payment methods, and more.

- Use the advanced search options

  Customers should have quick and simple access to all the information they require regarding goods and services. As a result, group the products in your NFT marketplace app by a few characteristics (for

example, art, images, music, videos, and memes). Customer satisfaction rises as searches are completed more rapidly. *Figure 6.5* displays crucial requirements to look for in the NFTs market:

Figure 6.5: *Important specifications to look for in the NFTs Marketplaces*

- Applying filters

  Filters are quite beneficial. Additionally, websites become easier to navigate. Include this functionality while creating a platform for the NFT collectibles market. Users can choose an asset based on its category, method of payment, expiration date, and status as a listing.

- Trading

  Customers need to be able to buy and sell NFTs that have been recorded on the platform. As a result, they ought to mention the status of such proposals as well as the deadline for submission of bids.

- User Account

  Users must first register an account in order to sell and buy NFTs on the

platform. Typically, upon registration, a person's email address, phone number, or social network account is used. Users must typically reveal the existence of their cryptocurrency accounts.

- Promotions

  This procedure ought should be quick and easy. It should ideally be an exact reproduction of items you might find on eBay. Create a system that is similar to a collection manager for the greatest outcomes. The specification of product downloads, names, prices, descriptions, tags, external links, and other characteristics is made easier by it.

- NFT wallet

  Users will need a wallet in order to transmit, receive, and store NFT tokens and cryptocurrencies. Integrating with a well-known bitcoin wallet is the simplest option. The wallet offers the broadest support for the NFT protocol. Wallets like Metamask, MyEtherWallet, Coinbase, and WalletConnect come to mind when discussing them.

- Reviews and ratings

  It expresses whether the user holds the lot or the seller in high regard. You can determine a package's value with the use of this knowledge. The scale typically runs from 1 to 10. Subscribers can access review submissions, which are similar to comments. After the transaction is over, either party may end it.

- Promptness

  Push notifications will be sent to users who have selected a specific category or store whenever there are new bids, status updates, new posts, lots for sale, or NFT platform updates.

- Assistance

  Every trading platform needs to offer this capability. Users can find information, find solutions to their queries, and overcome their challenges by using support services. An information platform, a chatbot, a call center, or email support are a few examples of support services.

Working of NFT marketplaces

NFTs work a little bit differently than traditional assets because they are

digital. As previously stated, in order to save your NFTs after purchase, you must first create a cryptocurrency wallet. You can also utilize an NFT wallet. Some wallets, however, support both NFTs and cryptocurrency.

You'll need some cryptocurrency relevant to the NFT you wish to purchase in addition to your wallet. The majority of exchanges support NFTs in ETH; however, some also accept Tezos (XTZ), Solana (SOL), FLOW, and other cryptocurrencies. *Figure 6.6* illustrates how the market for NFTs operates:

Figure 6.6: *Working of NFTs Marketplaces*

These marketplaces provide three fundamental functions in terms of how they operate:

- **Buying NFTs**: Investors can buy NFTs at an auction or through a fixed-price listing. Upon acquisition, the NFT shall be turned over to the Buyer.
- **NFT minting**: Numerous NFT exchanges give consumers the option of producing their own NFTs. This means transforming their work into a digital asset based on a blockchain.
- **Selling NFT**: Lastly, NFT marketplaces let vendors sell their NFTs to third parties. While many platforms offer royalties for transactions on the secondary market, sellers typically need to pay a portion of the money they receive in fees to NFT-selling platforms.

Creating an NFT marketplace

You might want to consider carrying out the following steps if you wish to

develop an NFT marketplace for your company:

- Decide on a domain:

  Before starting the creation of an NFT marketplace, you must first understand the domain. It will be a good idea to talk over any specific ideas you have with your developers. Planning and estimating the amount of time required to build the market will be aided by a productive discussion. Afterwards, based on the advice of the experts, choose between vertical and horizontal marketplaces.

- UI/UX design should be created for your project:

  When building a marketplace, UI/UX design is critical. The user interface (UI) for your program must be simple. A strong UI/UX enhances usability, which enhances the look and feel of the platform. As an illustration, NFTically offers its consumers a straightforward and flexible user interface.

- Switch to front-end development:

  You should act now to put your ideas into practice. For increased credibility and capability to meet your objectives, pick a reliable framework and collaborate with an experienced NFT developer.

- Token generator for smart contracts:

  The back-end development of an NFT marketplace differs from that of a conventional marketplace. The majority of the data must be verified and certified on the blockchain because the NFT marketplace is decentralized.

- Testing:

  One of the essential steps in creating an NFT marketplace software is testing. This method helps in locating and eliminating issues with bugs and other backlogs. Testing also provides assurances of the software's efficiency and effectiveness.

  After preliminary testing, post-launch support is necessary to ensure reliable operation and handle immediate issues. Testing, in particular, ensures the effectiveness and integrity of apps.

Types of NFT marketplaces

Before choosing where to buy NFT tokens, it's essential to have a firm understanding of the numerous NFT markets that are now accessible. The most popular types are listed below, so you can choose the one that best suits your requirements:

- NFT Art marketplace:

  As the name implies, these marketplaces are only for NFT art. The two most well-known online stores in this category, OpenSea and Rarible, allow artists to produce digital art NFTs and offer them for sale to collectors.

- Marketplace for NFT music:

  As they can be used to arrange songs, albums, lyrics, and soundbites, NFTs have the ability to shape the future of music, according to a recent Forbes article. NFT music marketplaces are experts in this area and enable collectors to buy NFTs of music from well-known artists.

- NFT Ethereum marketplace:

  These exchanges offer ETH-based digital assets and are built on the Ethereum blockchain. The largest Ethereum market right now is OpenSea, which has a $13.3 billion market cap.

- Solana's NFT marketplace

  The Solana blockchain, a quicker substitute for Ethereum, hosts the Solana NFT art marketplaces. As a result of Solana's high scalability, network fees can be decreased. There are now only a few significant marketplaces in Solana, with Magic Eden being the biggest.

- NFT Algorand marketplace:

  Another blockchain network that has recently experimented with NFTs is Algorand, where a variety of Algorand NFT marketplaces have emerged. As a **Pure Proof-Of-Stake** (**PPoS**) network, Algorand, the entire investing process is considered to be more environmentally friendly and scalable than the current Ethereum foundation.

- Marketplaces for NFT on Tezos:

  The XTZ token serves as the native currency of the Tezos blockchain, which is open-source. Tezos NFT markets have gained popularity over the past year, and well-known marketplaces like Rarible now sell Tezos-based NFTs.

- Places to buy BNB NFT:

  The popularity of the native asset of the cryptocurrency exchange, the Binance Coin, is also utilized by BNB NFT markets. The most popular NFT marketplace where consumers can buy NFTs with BNB as the unit of exchange is Binance.

- Gas fees for the NFT Marketplace:

  Gas expenses must be considered when using the finest Ethereum NFT marketplace. These costs merely represent the amount of computation necessary to finish specific transactions. Gas costs are incurred when a blockchain network operation, such transferring ownership of an NFT, is carried out.

  The most crucial thing to keep in mind is that gas prices are not set in stone and can change drastically. Because fees are based on the degree of network congestion, costs will increase as more people use the network. Additionally, faster transaction processing may result in higher gas costs; for instance, some platforms allow you to select a slower minting pace to reduce expenses.

  When using an NFT marketplace, you should be mindful of two types of gas costs:

- Charges for a single gas use:

  On some NFT markets, users will have to pay a one-time fee to establish their cryptocurrency wallets (such as OpenSea).

- Gas fees that recur:

  You will be charged recurring fees when you carry out routine network tasks. Examples of these actions include accepting a bid on an NFT you listed, selling an NFT, buying an NFT, withdrawing a bid from an NFT auction, and more.

OpenSea

The largest NFT market in the world is OpenSea. Among the Non-fungible tokens accessible are artwork, censorship-resistant domain names, virtual worlds, trade cards, sports, and collectibles. Assets for ERC721 and ERC1155 are included. Axies, ENS names, CryptoKitties, Decentraland, and other distinctive digital assets can be located, bought, and sold. They have

almost 700 projects, which range from digital art projects, naming systems like ENS, and digital art to trading card games and collectible games (Ethereum Name Service). *Figure 6.7* depicts the NFTs market place OpenSea:

Figure 6.7: *NFTs Marketplaces OpenSea*

The item minting tool from OpenSea allows creators to create their own blockchains. Without writing a single line of code, you can use it to build a group of NFTs. If you're working on a blockchain-based smart contract for a game, an online collectible, or another project involving one-of-a-kind digital products, you can simply join OpenSea.

You have three options when selling something on OpenSea: a fixed price listing, a sliding price listing, or an auction listing.

Since OpenSea has the highest trading volume of any marketplace, many people claim that it is the best place to buy NFTs. OpenSea was the first platform to mainstream NFT trading after it gained more than a million members since its launch.

A wide range of NFT categories is available on the Ethereum-based market,

including art, domain names, in-game items, and more.

The fact that OpenSea supports more than 150 different cryptocurrencies as payment is one of its most notable features. Investors can now buy and sell NFTs using their bitcoin balance thanks to this. When an item sells, OpenSea charges the seller a transaction fee of 2.5 percent; the buyer, however, is not charged any costs (apart from the usual network expenses). Additionally, customers may instantly connect their wallets to the marketplace using OpenSea, which supports 14 different crypto wallets.

The Ethereum-based market offers a wide variety of NFT categories, including art, domain names, in-game products, and more.

One of OpenSea's most prominent characteristics is the fact that it accepts more than 150 different cryptocurrencies as payment. As a result, investors can now buy and sell NFTs using their bitcoin balance. OpenSea charges the seller a transaction fee of 2.5 percent when an item sells; the buyer is not charged any fees (apart from the usual network expenses). Also, OpenSea provides royalties to the owner of the NFT up to 10%. Also, there may be more than one owner of NFT to claim the royalty and this can be configurable in the Collection settings. Additionally, consumers can use OpenSea, which supports 14 different crypto wallets, to rapidly link their wallets to the market. *Table 6.1* shows the network, gas fee, collection size, and trade volume of OpenSea.

Regarding OpenSea:

Network/Token Used	Ethereum
Gas Fees	Yes – for account registration and when making payment
Collection Size	1,000,000+
Trade Volume	>$5bn per month

Table 6.1: *Network, gas fee, collection size, and trade volume of OpenSea*

Creating an NFT on OpenSea

On OpenSea, creating an NFT is simple. Let’s set up the first NFT.

Creating your first NFT collection entails the following steps :

1. Click on the Create tab in the top right-hand corner of OpenSea. *Figure 6.8* shows the create tab to create NFT in OpenSea:

Figure 6.8: *Create tab to create NFT in OpenSea*

2. A page where you can upload your NFT file appears. Name it and provide a description. *Figure 6.9* shows the file to upload to create NFT:

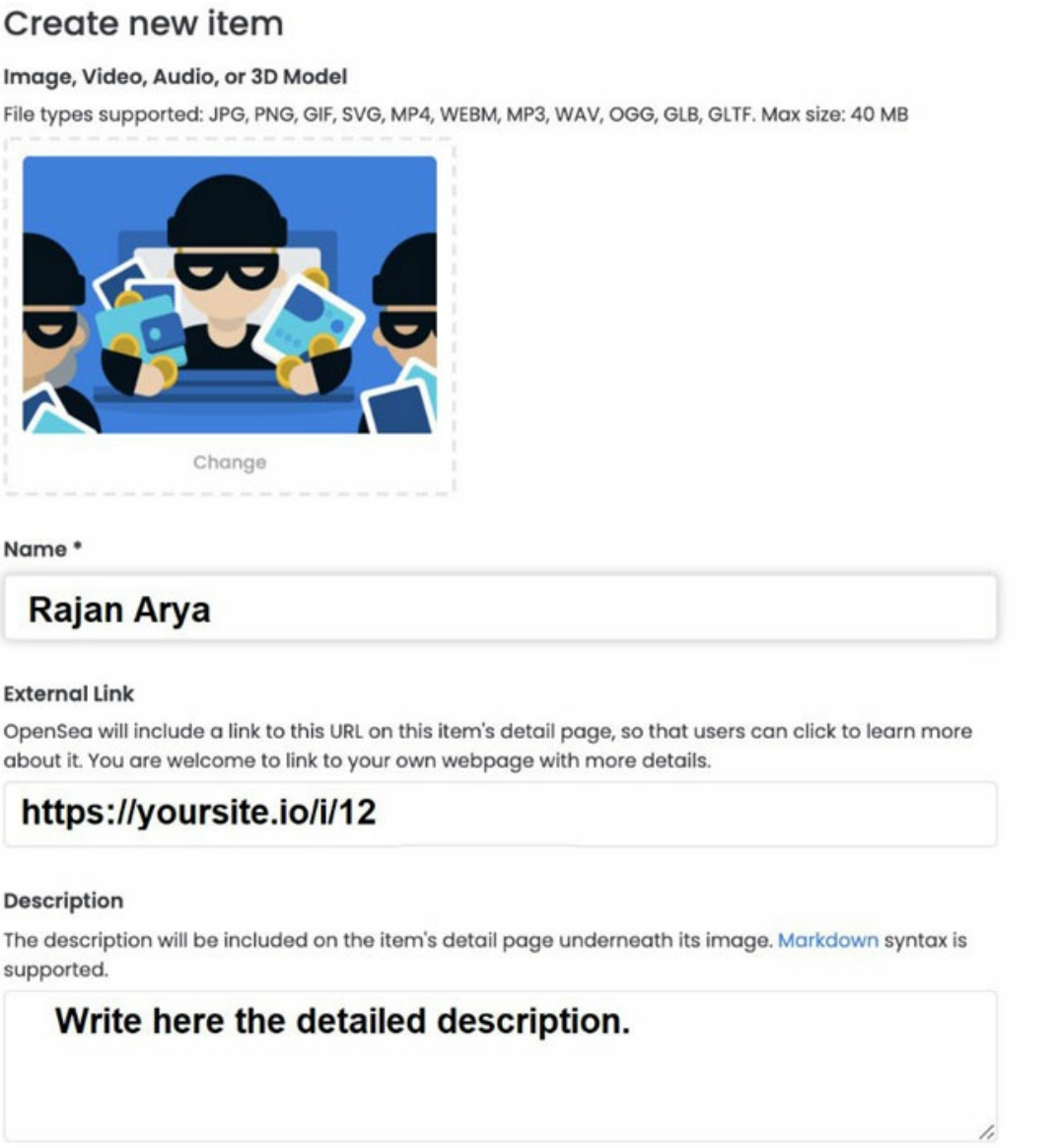
Create new item
Image, Video, Audio, or 3D Model
File types supported: JPG, PNG, GIF, SVG, MP4, WEBM, MP3, WAV, OGG, GLB, GLTF. Max size: 40 MB
Change
Name *
Rajan Arya
External Link
OpenSea will include a link to this URL on this item's detail page, so that users can click to learn more about it. You are welcome to link to your own webpage with more details.
https://yoursite.io/i/12
Description
The description will be included on the item's detail page underneath its image. Markdown syntax is supported.
Write here the detailed description.

Figure 6.9: *File to upload to create NFT*

3. You can further modify your NFT after filling out those fields. This entails incorporating it into an existing collection or adding attributes, metrics, and levels. Unlockable content is an additional option. *Figure 6.10* shows to freeze metadata:

Collection

This is the collection where your item will appear.

Properties
Textual traits that show up as rectangles

Levels
Numerical traits that show as a progress bar

Stats
Numerical traits that just show as numbers

Unlockable Content
Include unlockable content that can only be revealed by the owner of the item.

Explicit & Sensitive Content
Set this item as explicit and sensitive content

Supply

The number of copies that can be minted. No gas cost to you! Quantities above one coming soon.

1

Blockchain

Ethereum

Freeze metadata

Freezing your metadata will allow you to permanently lock and store all of this item's content in decentralized file storage.

To freeze your metadata, you must create your item first.

Create

Figure 6.10: *To freeze metadata*

4. Although Ethereum is the default blockchain, you can choose to mint your NFT on a different one.
5. Click on Create after you're finished customizing your NFT.

   Congratulations—you just created your first NFT!

Selling an NFT using OpenSea

Click on your profile symbol in the top right-hand corner of the OpenSea page.

To sell an NFT, follow the given steps:

1. Click on Sell in the top right-hand corner of the item page. *Figure 6.11* shows the sell button:

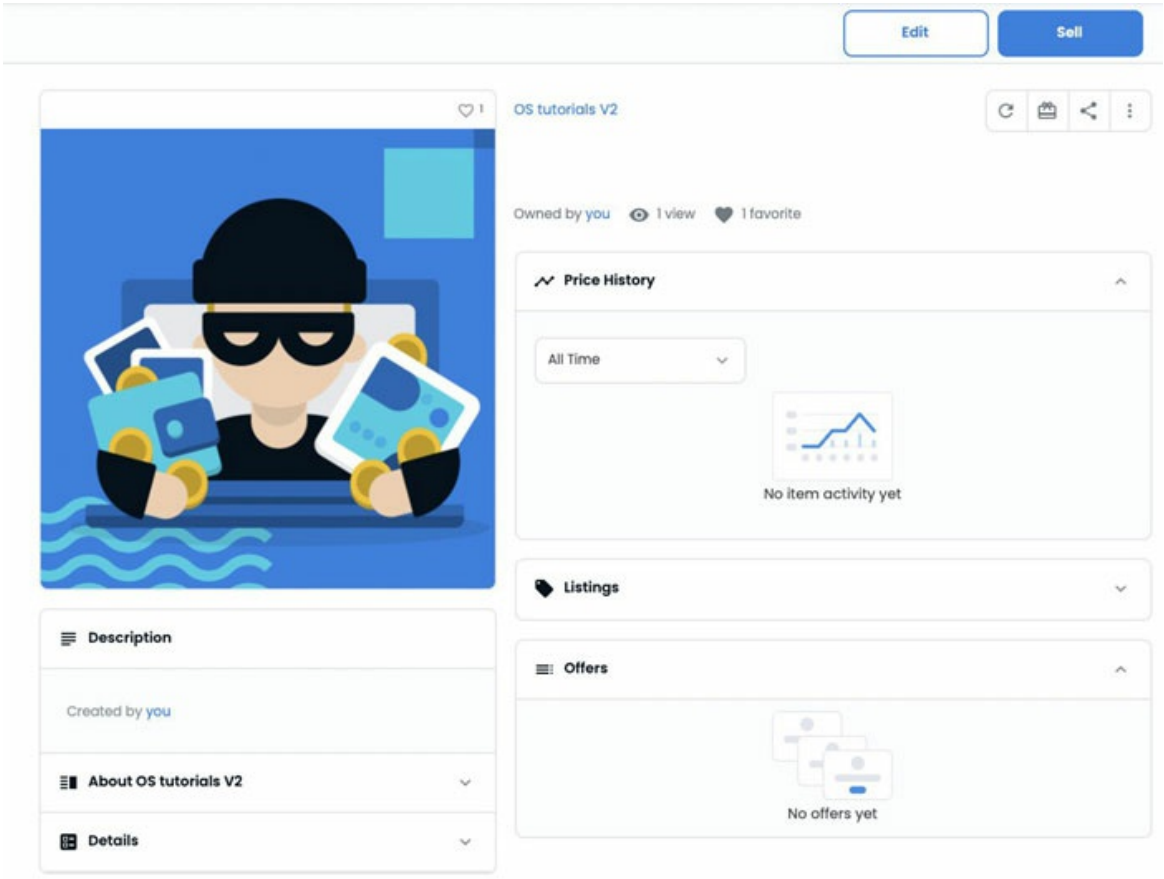

Figure 6.11: *Sell button to sell an NFTs*

2. You will be directed to the listing page where you can select the sale type and price.
3. The seller determines the NFT pricing in a fixed-price transaction. The price is set as 1 ETH as shown in *Figure 6.12*. You can look at how timed auctions operate. *Figure 6.12* displays setting the NFT pricing:

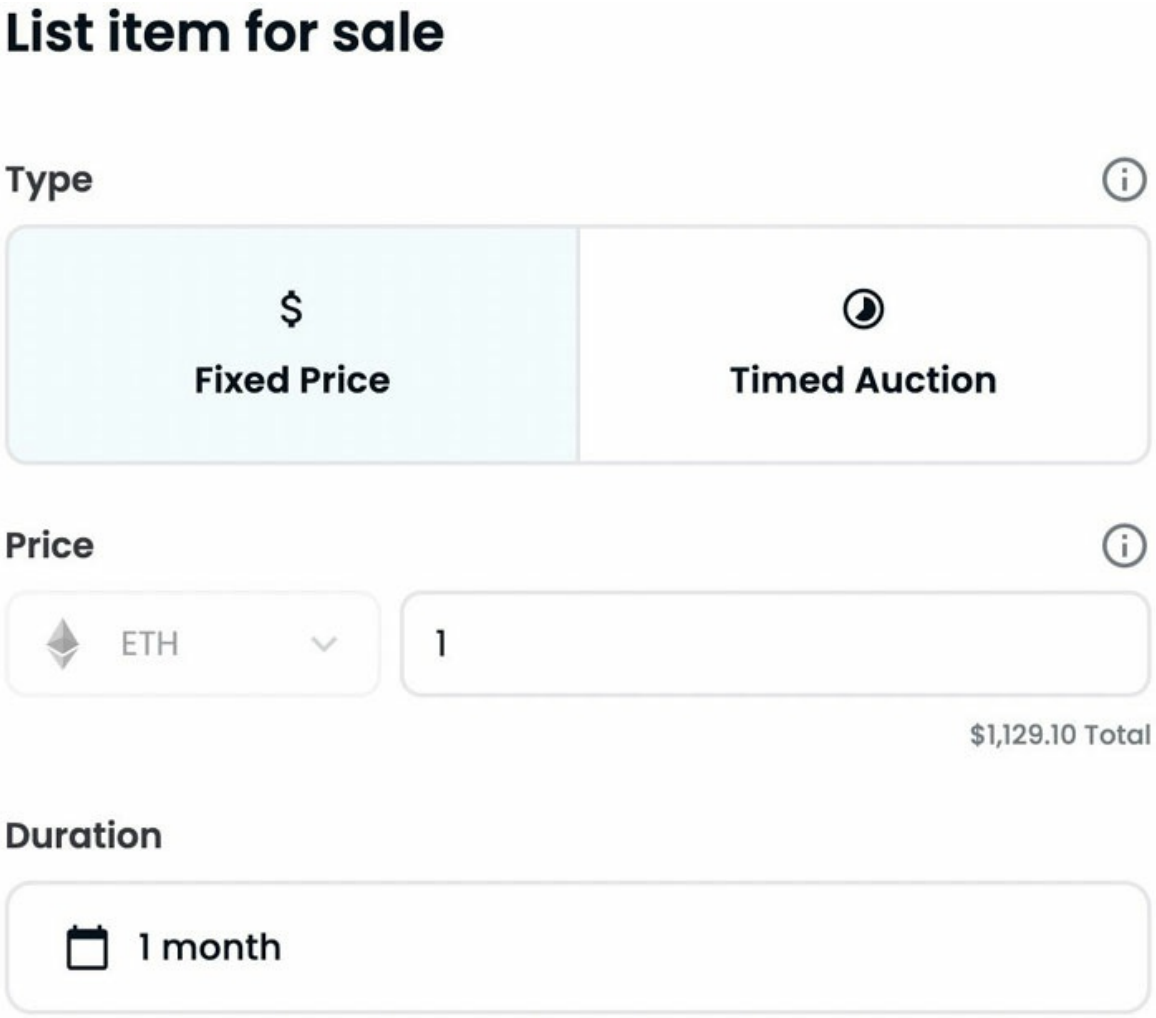

Figure 6.12: *Setting the NFT pricing*

4. Additionally, you may choose a preset period for the sale or enter a custom time using the calendar.
5. Finally, you have the option to reserve the item for a particular customer. Open the More options area and type the buyer's wallet address into the Reserve for specific buyer form to achieve this. *Figure 6.13* shows to reserve an NFT for a particular buyer:

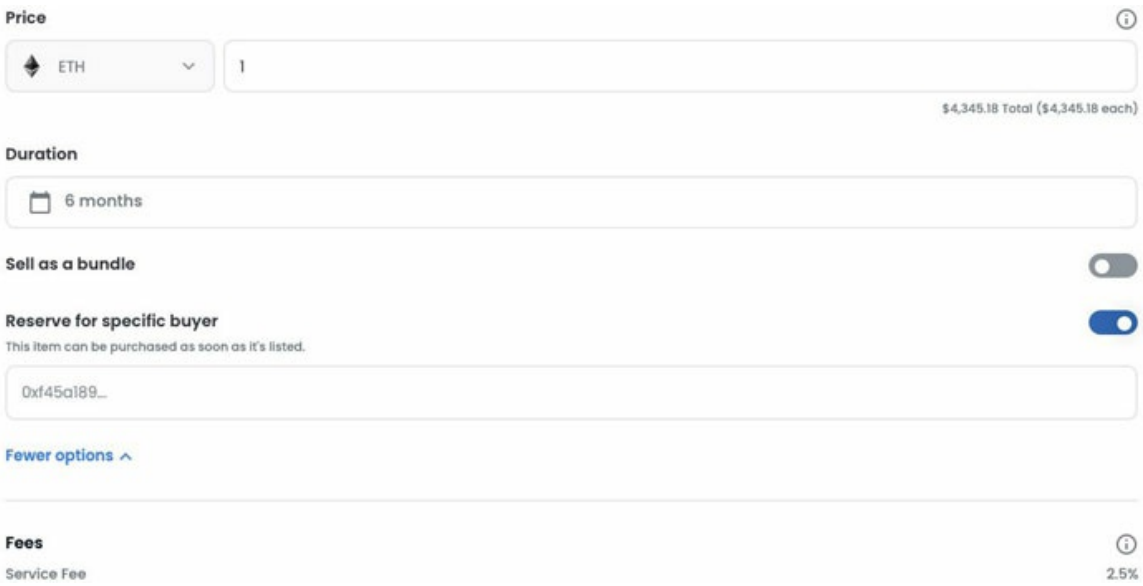

Figure 6.13: *Reserve an NFT for a particular buyer*

6. The probable sale fees are shown at the bottom of each of those choices. OpenSea's Service Fee of 2.5 percent and the Creator Earnings of 10% are included in this sale, for a total of 12.5 percent. The maximum percentage that can be subtracted from an NFT sale on OpenSea is this one.

Finalizing your purchase:

1. After that, you'll be required to sign a transaction to confirm your sale.
2. If this is your first time selling on OpenSea, you will need to set up your wallet first. Additionally, there might be additional approval and signature needed to permit OpenSea to trade the item on your behalf if the item you're offering was not created on OpenSea but rather through a custom contract.
3. When your listing is finished, a pop-up confirmation similar to the one below will appear. Share your listing on social media, please! *Figure 6.14* shows how to list NFTs on social media:

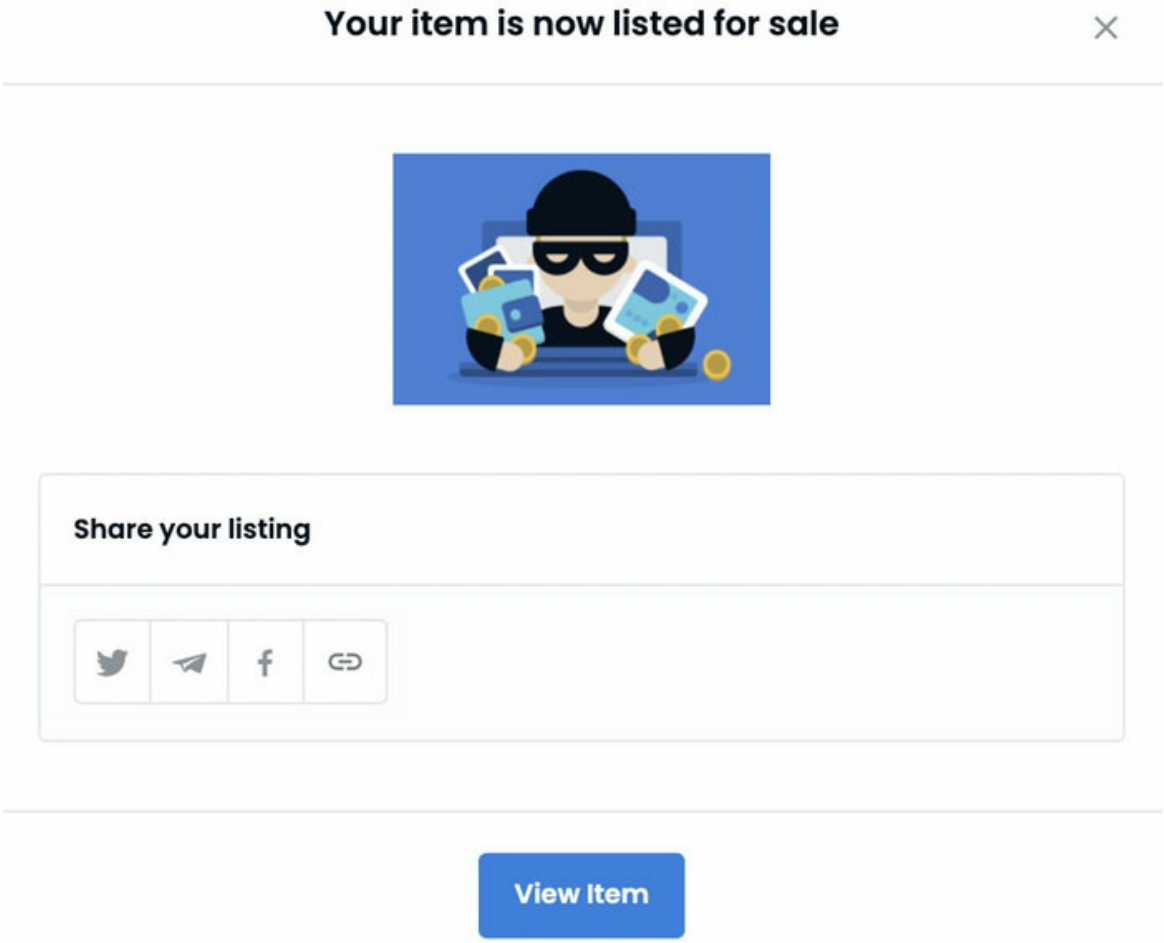

Figure 6.14: *To list NFTs on social media*

4. Select More Active listings on your profile page to view the things you have posted for sale.

Rarible

As its "ownership" token, Rarible employs the ERC-20 RARI token, which is a community-owned NFT marketplace. Active users that make purchases or sales on the NFT marketplace are rewarded by Rarible with the RARI token. It delivers 75,000 RARI per week.

The site pays particular attention to its artistic assets. Rarible gives authors the ability to "mine" new NFTs in order to sell their books, music CDs, digital artwork, or movies. Only the buyer will have access to the complete project; the creator may even give everyone who visits Rarible a sneak peek of their creation. *Figure 6.14* shows the Rarible NFTs Marketplaces:

Figure 6.15: *Rarible NFT marketplace*

In a variety of fields, including art, photography, gaming, metaverses, music, domains, memes, and more, Rarible buys and sells **Non-Fungible Tokens** (**NFTs**).

Since it offers a variety of digital art and photography, games, music, domains, and even metaverse objects, Rarible is one of the top NFT art markets for investors. The website charges 2.5 percent, which is at the higher end of the price range, from both buyers and sellers. Rarible, on the other hand, is able to host NFTs created on Tezos, Flow, and Ethereum and offers compatibility with a large number of blockchains.

The capability to buy NFTs using a credit or debit card is one of Rarible's most outstanding features. It is one of the biggest NFT markets, with coverage in over 190 nations and an easy way to purchase Rare NFTs anywhere in the world. Furthermore, Rarible supports a variety of wallets, including MetaMask and Coinbase, enabling investors to securely hold onto their money after making a purchase. *Table 6.2* shows the network, gas fee, collection size, and trade volume of Rarible.

About Rarible:

Network/Token Used	Ethereum (with support for Flow and Tezos)
Gas Fees	Yes – an average of 0.010 ETH when purchasing NFTs
Collection Size	400,000+
Trade Volume	>$390,000 per week

Table 6.2: *Network, gas fee, collection size, and trade volume of OpenSea*

AtomicMarket

Numerous websites use AtomicMarket, an NFT market smart contract with shared liquidity. Shared liquidity is the practice of everything posted on one market appearing on all other exchanges. *Figure 6.15* shows the AtomicMarket NFTs Marketplaces:

Figure 6.16: *AtomicMarket NFT marketplace*

It functions as a market for Atomic Assets, an EOS.IO network-based non-fungible token standard. Digital assets can be bought, sold, and auctioned on the Atomic Assets marketplace utilizing the Atomic Asset protocol.

On AtomicMarket, you may search for available things and sell your own NFTs. It is simpler to identify genuine NFTs when NFTs from well-known collections have the verification tick. A blacklist is updated to include malicious collections.

NBA Top Shot

Top Shot is an NFT marketplace where you can purchase, sell, and trade NBA moments that are packed with highlight videos and work like trading cards. It had limited beta testing before being made available to the general public in October 2021. It is a blockchain-based marketplace where you can buy, sell, and trade numbered variations of video highlights with valid licenses. Users can buy digital cards that feature NBA players and scenes. Then, other players can buy and sell some of their cards. These digital collectibles' value changes over time.

Top Shot is a blockchain-based platform for virtual trade cards that was developed by the NBA. The NBA Players Association and Dapper Labs collaborated on the project. The FLOW blockchain, which was developed by Dapper Labs as a "developer-friendly blockchain intended to enable the next generation of games, applications, and digital assets," serves as the foundation for the platform.

The method also makes use of digital photos and NBA videos, much like trading cards. Moments is created by Dapper Laps after receiving permission from the NBA to use reels. Moments are highlights from videos that are related to NFTs. Every single one has a special digital serial number that both confirms authenticity and emphasizes how rare the Moment is. The foundation of the Top Shot ecology is moments.

The team creates a small number of NFTs, similar to trading cards, in order to create scarcity. As a result, both the value and rarity of particular Moments increase.

NBA NFTs that have been created on the FLOW blockchain and contain significant "Moments" are available for users of NBA Top Shot to purchase, sell, and collect. Certain Moments are more significant than others because they are more uncommon.

Similar to real trading cards, moments are also manufactured in "Packs." As a part of a Series, Packs are created in Sets. Each Series lasts the same number of games as an NBA season. Customers can thus purchase brand-new digital packs of NFT Moments that feature the season's most important plays each week. Legacy fans won't miss out on any of their favorite plays from their prior seasons, even if the current season's events lead to pack drops. There are several ways to gather memories of the past.

Additionally, the idea aims to provide fans with a game-like experience. With

their NFTs, users can compete in Top Shot tournaments for prizes including rare packs, moments, and prizes. For example, to receive a Series 3 2022 All-Star Standard pack, users must submit 12 specific Series 3 Metallic Silver fandom edition moments.

Nifty gateway

Famous NFT sellers and digital artists including Pak, Beeple, Daniel Arsham, and Grimes have all sold their works on Nifty Gateway. The website is managed by Gemini, a reputable and secure cryptocurrency exchange and is recognized as a high-end market because of its affiliation with well-known manufacturers and businesses. *Figure 6.16* shows the Nifty gateway NFTs Marketplaces:

Figure 6.17: *Nifty Gateway NFT marketplace*

Because it gives authors a cut of revenues on the secondary market, Nifty Gateway stands out. As a result, you will receive a portion of all sales made using your NFT. Additionally, Nifty Gateway provides "open editions," which provide artists with the opportunity to print as many copies of their creations as they choose for a short time.

By taking care of all the technical aspects of NFT development and sale and providing technical assistance, Nifty Gateway also makes it simpler for makers to sell NFTs. If you're a collector as well, Nifty Gateway enables you to purchase more NFTs with fiat money.

In contrast to other NFT exchanges, Nifty Gateway hosts the NFTs it buys. This suggests that you don't keep the NFTs you sell or buy in a wallet. Instead, they are saved in your Nifty account through Gemini and Nifty Gateway.

SuperRare

SuperRare primarily serves as a marketplace where customers may buy and sell unique, limited-edition digital artworks. Each work of art is created by a network artist and tokenized as an ownable and tradeable crypto-collectible digital good. They describe themselves as a hybrid of Instagram and Christie's, offering a fresh online platform for interacting with art, culture, and collecting.

On SuperRare, every work of art is a digital collectible that is tracked and encrypted on the blockchain. Additionally, to the market, SuperRare has built a social network. Given that they have a documented history of ownership, digital artefacts are perfect for a social setting.

The Ethereum network's native currency, ether, is used in all transactions.

Although SuperRare only works with a small number of carefully chosen artists at the moment, you can fill out a form to submit your artist profile and be considered for their upcoming full launch.

Alcor NFT/Alcor Exchange

The Alcor Exchange platform includes a secure wallet for storage and trading exchange, which makes using cryptocurrencies easy. Alcor Trading is outfitted with cutting-edge technology that makes exchanging crypto assets as quick and easy as possible.

Wax (Atomic hub)

The most popular and often traded blockchain platform in the world for NFTs, dApps, and video games is called WAX, or Worldwide Asset eXchangeTM. It offers the safest and most convenient way to make, buy, sell, and exchange physical and virtual goods with anyone, anywhere.

WAX is the most successful NFT network thanks to its ability to successfully facilitate the trade of millions of NFTs from partners like Topps (MLB),

Capcom (Street Fighter), Funko, Atari, Sony's Funimation, well-known films (Princess Bride and SAW), renowned entertainers (Deadmau5, Weezer, and William Shatner), and many more.

Additionally, WAX has developed vIRL® NFTs that are distinct from the standard NFTs seen on other blockchains. By using these dynamic characteristics, you can attach a vIRL® NFT to an actual object and transmit ownership up until a collector is ready to claim it as their own without having to send anything physically. Integrations with apps and video games, marketing tools, and V-commerce possibilities are a few examples of these functionalities. Every vIRL® NFT is built using the carbon-free and energy-efficient WAX Blockchain.

The world's largest NFT ecosystem, which consists of more than 60 million NFT assets from more than 30,000 dApps and NFT initiatives, may be purchased using WAXP. Through a number of dApps and markets, users can buy and sell NFTs using WAX tokens, including **https://wax.atomichub.io/**, **https://neftyblocks.com/**, and others.

Additionally, a number of important dApps, like **https://www.btcorigins.com**, **https://gpkbernventures.com**, and **https://www.kogs.gg/**, provide NFTs directly utilizing WAX tokens. In the WAX NFT ecosystem, numerous new play-to-earn games are also crucial players.

Foundation

A specialized platform called Foundation brings together digital pioneers, early adopters of cryptocurrency, and collectors to improve culture. The phrase "new creative economy" was used. The focus is primarily on digital art.

In their inaugural blog post on their website in August 2020, they issued an open invitation for innovators to experiment with cryptocurrencies and investigate the concept of value. They invited artists to "hack, undermine, and misrepresent the value of creative labor."

When an NFT is traded on Foundation, the artist receives 10% of the secondary transaction value, or the sales value when a collector sells their piece to another party for a higher price.

If you are looking for a location to acquire NFT art, Foundation is a great

place to start. Popular NFT retailer Foundation specializes on offering one-of-a-kind art drops. The Foundation Marketplace uses an auction system to sell NFTs, with most auctions lasting 24 hours following the opening bid. You can easily find the digital art you're seeking thanks to Foundation's straightforward user interface. On the Ethereum blockchain, it is constructed.

However, by paying a 10% royalty on secondary market purchases, the NFT art marketplace enables sellers to recoup some of their expenses. Customers are required to utilize ETH to pay for NFT purchases because Foundation is based on Ethereum. Only wallets made with MetaMask or WalletConnect are supported by Foundation at the moment, which may restrict access to investments. *Table 6.3* shows the network, gas fee, collection size and trade volume of the Foundation.

About Foundation:

Network/Token Used	Ethereum
Gas Fees	Yes – when buying an NFT
Collection Size	100,000+
Trade Volume	>$60,000 per week

Table 6.3: *network, gas fee, collection size, and trade volume of Foundation*

VeVe

Veve's official launch partner selection by well-known corporations like Marvel, Pixar, and Coca-Cola is evidence of the platform's appeal.

In an official tweet sent on Wednesday, Veve acknowledged a security hole on its network and said that the attackers had obtained a "substantial amount" of gems illegally. The app-based NFT platform has disabled the marketplace and the possibility to purchase gems while the investigation is ongoing.

Players can exchange gems, the in-game currency for VeVe, for collectibles in the market or during drops. Early reports claim that the attackers took advantage of a weakness in the buying mechanism to manufacture millions of diamonds without having to pay for them. One user reported that their friend used an expired credit card to purchase diamonds, and the transaction was

successful.

Crypto.com

Crypto.com NFT is a division of Crypto.com, one of the most popular cryptocurrency exchanges available. The majority of traders are aware of Crypto.com, which has a stellar reputation for costs and user-friendliness. Due to NFTs' incredible popularity, Crypto.com decided to launch its marketplace in March 2021 on the Crypto.org blockchain.

Users of Crypto.com must first create an additional account, which only takes a few minutes, in order to use the NFT Marketplace on Crypto.com. After it has been created, users can instantly authenticate their NFT account by connecting it to their Crypto.com trading account via the app. Overall, this is a simple procedure that enables customers to utilize the functions of the Crypto.com ecosystem.

The market offers a wide range of the best NFTs, including works of art, video games, sports, music, and more. Each NFT will offer alternatives for buyers and sellers by being posted at a predetermined price or through a standard auction. It's fascinating that Crypto.com NFTs can be rapidly purchased with a credit or debit card. Several other NFT markets, on the other hand, require cryptocurrencies to be used for payments.

Finally, the popularity of the Crypto.com NFT Marketplace might be attributed to its straightforward approach to NFT trading. To ensure that everyone has a choice, users can invest using either the browser-based platform or the Crypto.com NFT app.

The NFT Marketplace on Crypto.com is perfect for this. We think that this market will eventually appeal to everyone interested in NFTs based on our research and testing. The following is included in this:

- Buyers of NFTs for the first time
- NFT investors have much experience
- Celebrities that are interested in NFT drops
- NFT traders interested in profiting from secondary market sales
- Users who are looking for NFT freebies
- Those in search of a fantastic NFT app

The "all-in-one" concept employed by Crypto.com enables easy connectivity between the NFT market for all users. This element of the ecosystem at Crypto.com ensures that customers do not have to exchange NFTs elsewhere.

Magic Eden

On the Solana blockchain, Magic Eden is a decentralised application (dApp). On the blockchain, it enables users to generate and administer Non-fungible tokens (NFTs). Digital collectibles, game assets, and other uses are all possible with these NFTs.

The following appealing qualities describe Magic Eden:

- **Launchpad:** This exclusive Magic Eden feature enables users to quickly and easily create NFTs without the requirement for in-depth NFT expertise or development experience. The platform currently only accepts a small number of projects, but this is probably going to alter in the future.
- **Upcoming Launches:** Magic Eden provides a curated list of upcoming launches so you can stay informed, saving you the time and effort of finding the next NFT drop from your favourite developer.
- **Popular Collections:** This feature displays the most recent and well-liked NFT projects on the Solana blockchain, ensuring that you are up to date on the projects that are popular right now. You may easily search, learn about, and invest in the newest projects thanks to it.

Binance

A one-stop shop for buying and selling digital collectibles and art is the Binance NFT marketplace. The most liquid marketplace for consumers to develop and trade NFTs is the Binance NFT marketplace, which is supported by Binance's blockchain technology and community.

Currently, you may use cryptocurrencies to make hotel reservations on the Binance Marketplace, create and distribute gift cards, take part in Launchpad, and get paid with Liquid Swap.

Numerous NFTs are available on Binance.

The term **Non-Fungible Token** (**NFT**) refers to an asset that is fungible and has easily exchangeable units, much like money.

Understanding the importance of creators in the developing NFT ecosystem, Binance NFT seeks to optimize value for all types of producers. Our creator-first platform consequently provides some of the lowest transaction costs in the industry.

Selected "Premium Event" collections pay artists 90% of sales revenue, raising the bar for NFT awards.

Here, we'll list and evaluate the various categories of NFTs that are available because each NFT marketplace offers unique collections.

- Gaming:

  This one is entertaining because it gives players more power over the digital elements of their game. It will also have a brand-new gaming economy where players can make real money by designing outfits and gear that are suitable for quests.

  NFTs aren't actual objects, but they may be bought and sold the same as any other digital asset. Any physical or digital asset can have its own credentials represented by a digital token.

  The blockchain is currently being used by collectors to bring their groups together because it contains many of the "conventional" collectibles that fans desire. You can find coins, stamps, trading cards, and other items here.

- Collections of NFT:

  If you're looking for a less conventional choice, Top Shots enables you to record a significant play or moment from your preferred sporting event. No matter where they are, they guarantee to offer their users a stake in any activity.

  For the first time ever, Team Manila has released an NFT collection in the Philippines to honor the nation's independence.

- Assets and documentation from the real world:

  You may tokenize and save an essay or a tweet on the blockchain. The "first" tweet cost $2.9 million, according to Jack Dorsey. Every asset, therefore, has the potential to be used in a non-financial transaction (NFT).

- Jack Dorsey NFT:

On May 8, Canelo Alvarez will face Billy Joe Saunders, and to celebrate, DAZN will hold a number of NFTs in the Philippines.

- Art:

  This is among the most important. Due to the smart contract, which can speed up and enhance the artists' revenues by tying them directly to the buyers, when you sell art as an NFT, the creator will receive payments on a regular basis.

  The NFT collection of the renowned digital artist Beeple's work was sold at Christie's for $69 million.

- Real estate investing:

  To maintain land registration records and property registration records, there is a lot of paperwork and bureaucracy. NFTs, on the other hand, have the ability to entirely digitize and change the procedure.

  The property might be transformed into blockchain tokens that can be easily split and traded on the market.

- NFTs in real estate

  This can be used by anyone to avoid real estate middlemen, including banks, lawyers, agents, and brokers. Other than that, there won't be any further problems with the property.

NFT fees on Binance

When you trade, deposit, withdraw, or buy NFTs on the Binance NFT platform, transaction fees can apply. Market circumstances and network status are just two of the many variables that have an impact on transaction costs.

Fees for deposits

When depositing NFTs to Binance, you have the option of choosing the gas fee you want to pay. Please remember that different factors affect how much petrol costs.

Fees for Transactions

You will be assessed a platform service fee when you sell or buy an NFT. One percent is the trading fee on Binance NFT.

Tips for selecting NFTs Marketplaces

Few tips for selecting NFTs Marketplaces are as follows:

- Remember that an NFT (non-fungible token) only serves to represent asset ownership at first.
- You must decide what kind of digital asset you desire to buy, sell, or generate before selecting an NFT marketplace.
- Since the written word, movies, video games, art, collectibles, and other things may all be tokenized on a blockchain (like Ethereum (CRYPTO: ETH), the most common blockchain network on which NFTs are built), it's a good idea to start by focusing your hobbies.
- The kinds of tokens that a marketplace accepts should also be considered.
- A variety of tokens are accepted by several exchanges. Others are private marketplaces that operate with a special proprietary token.
- Ensure that you have the necessary coins or tokens in your blockchain wallet before registering for an account on the NFT marketplace.
- You will receive an invitation to connect your wallet to the NFT marketplace after creating an account.
- Find out what kind of security the market has in place and if there have ever been any issues.

Conclusion

We studied NFTs market in this chapter. An NFT marketplace is your passport to purchasing and selling digital items, including music, art, and entire virtual worlds, if you want to join the NFT craze. Think of NFT markets as the digital equivalent of Amazon.

Then, we discussed various types of NFTs Marketplaces such as OpenSea, Rarible, AtomicMarket, NBA Top Shot, Nifty gateway, SuperRare, Alcor NFT/ Alcor Exchange, Wax (Atomic hub), Foundation, NBA Top shot, VeVe, Crypto.com, Binance.

In the end, we discussed how to create and sell NFTs on the OpenSea marketplace. In the next chapter, we will learn about the security of NFTs. NFTs are registered on the blockchain and connected to your wallet address,

proving your claim to a purchased NFT is similar to proving your wallet's seed phrase.

Key terms

- **NFTs Marketplaces**: Online marketplaces for purchasing, trading, and minting NFTs.
- **Binance**: A one-stop shop for buying and selling digital collectibles and art.
- **The Alcor Exchange platform**: A secure wallet for storage and a trading exchange, makes using cryptocurrencies easy.

Multiple choice questions

1. **NFTs Marketplaces can be used for:**
    a. Purchasing NFT
    b. Trading NFT
    c. Minting NFT
    d. All of the above
2. **NFT marketplaces can be useful in a number of other areas outside dealing with artwork. The spots in the NFTs Marketplaces are:**
    a. Digital Art
    b. Swapping
    c. E-learning services
    d. All of the above
3. **If you want to launch an NFT marketplace for your business, you might want to think about:**
    a. Selecting a domain
    b. Creating an NFT
    c. Change from front-end development
    d. Smart contract token generator

4. **_____is the biggest NFT market in the world.**
    a. OpenSea
    b. Rarible
    c. AtomicMarket
    d. SuperRare
5. **Famous NFT sellers and digital artists including Beeple, Pak, Daniel Arsham, and Grimes have all sold their works on:**
    a. SuperRare
    b. The Alcor Exchange platform
    c. Nifty Gateway
    d. Foundation

Answers

1. **d**
2. **d**
3. **a**
4. **a**
5. **c**

Join our book's Discord space

Join the book's Discord Workspace for Latest updates, Offers, Tech happenings around the world, New Release and Sessions with the Authors:

https://discord.bpbonline.com

CHAPTER 7

Security of NFTs

You learned about the NFT marketplace for buying and selling NFTs in the previous chapter. NFT marketplaces play a crucial role in bridging the gap between buyers and sellers. NFT markets may in some cases, offer additional resources for generating NFTs quickly.

Artists may use specialized platforms for marketing their NFT creations. Customers can look for NFTs on the market and then place a bid on the item they want. As a result, to make sure they are getting reasonable prices on pieces of art, collectibles, and other digital assets, every NFT developer or enthusiast should check the NFT marketplace list.

You will learn about NFT security in this chapter. Since NFTs are linked to your wallet address and registered on the blockchain, establishing your individual ownership is comparable to establishing the validity of your wallet's seed phrase. To protect your copy of the work from accidental deletion or loss, you can back up the digital art source file (in any format) if you have it. This is also important for insurance reasons and for non-traditional art that might pass through several different hands, such as auction houses.

In this chapter, we will learn about several NFT security measures in detail.

Structure

In this chapter, we will cover the following topics:

- NFTs security
- The future of NFTs
- Re-entrant attack
- Blockchain-related issues
- DOS attack
- Spoofing

- Information leakage
- Tampering
- How to keep your assets safe

Objectives

After reading this chapter, you should be able to know about Re-entrant attacks, DOS attacks, Spoofing, Blockchain-related issues, and understand information leakage.

NFTs security

NFTs, or non-fungible tokens, are the newest trend in cryptocurrencies. Everyone was interested in learning how to make, trade, and invest in NFTs because they fully dominated the market.

Most people who enroll in NFTs believe they are solely focused on the arts. This is the furthest thing from the truth. It is generally true that those who are more aware of these special tokens think that everything could eventually turn into an NFT.

However, most investors are worried about the security of NFTs and their markets. The best cryptocurrency systems are the target of cyberattacks and markets are probably next.

Although NFTs are currently popular, they have been in existence for quite some time. NFTs were created for the first time in 2012 on the Bitcoin network. The original idea was called Colored Coins, representing marked standard Bitcoins whose use depended on the mark.

The first NFT Quantum was created in 2014. In 2016, programmers advanced even further, testing how Bitcoin would work with NFTs. However, the idea of leveraging the Bitcoin blockchain was despised by many. Therefore, NFTs eventually switched to Ethereum.

In 2017, NFTs settled on Ethereum. Two of the first attempts to approach NFTs were CryptoPunks and CryptoKitties. On the other side, the ERC-721 token has not yet been developed. Several blockchains are creating markets to enable users to create and sell NFTs since the technology is currently expanding.

In an environment where technology is constantly evolving, art that evokes

our emotions has inspired a new generation of art admirers. One million works of art are created each year, and one million are stolen. *Figure 7.1* shows whether NFTs are secure or not:

Figure 7.1: *NFTs security*

According to the darknet, the market for stolen art is worth about $6 billion annually. This statistic is a byproduct of the digital age, in which advanced technology has made it possible for individuals to share digital artwork, memes, tweets, music, and video as GIF and MP4 files.

To minimize losses, non-fungible tokens have been developed. NFTs have become more well-liked as a type of online investment alongside cryptocurrencies since they are more reliable and secure than fungible tokens.

Working of NFTs

NFTs are not cryptocurrencies, even though they are tokens. On the blockchain network, non-fungible tokens are data units. NFTs cannot be utilized interchangeably since they are non-fungible.

For instance, the cost of one NFT will never be the same as that of another, yet the cost of one bitcoin will never change. This distinguishes each NFT.

A single NFT can only have one owner at any given time and cannot be

duplicated. This is one of the reasons why artists hurried to upload their work as NFTs. The NFT's owner/buyer is the only owner, even though the content can be copied and shared.

Are NFTs safe?

There are a few things to consider before investing in NFTs. NFTs are typically risk-free investments. But they might be compromised. As this industry is new, there is a lot of potential for market manipulation and online attacks.

The frequent value of NFTs makes both them and their owners target criminals. In general, it should be safe to purchase the NFT on its own, but investors should exercise caution when using the platform. NFT platforms are vulnerable to attacks from bad actors. As a result, users can forget their login information or have security problems.

On the other side, even if the platform may be quite secure, an NFT owner could unwittingly click a malicious link in an email that can steal their NFTs. Unfortunately, investors usually lose money since lost NFTs cannot be retrieved.

The safety ratings for each of the nine various NFT types are as follows:

- Physical and digital art

  The most popular NFT on the market right now is art. Additionally, a lot of expensive artworks are being sold online, like Beeple's Everydays: The First 5000 Days. At an auction, this piece of art garnered $69 million. GIFs are also common in the art world.

  Some artists offer their paintings as NFTs rather than prints by scanning them. They receive greater compensation and are free from copyright concerns.

  Contrary to popular belief, it is not possible to simply download the image and take the NFT. The NFT will continue to be a unique offering on the platform.

- Listen to music

  Not only digital art but also other materials can be used to create NFTs. For instance, a lot of NFT exchanges now accept audio files. Even though music has been freely available for years, some musicians have

chosen to discontinue using conventional methods of distribution.

Additionally, the average musician only receives a small fraction of their revenue. Using NFTs, they might make a lot more money—possibly close to 100%. They can also create original musical compositions that change every time their owner listens to them, thanks to NFT technology.

A musical NFT that the original owner sells is usually safe to preserve. Sadly, several platforms have been charged with stealing music from musicians and selling it without permission as NFTs.

- Items from video games

  Video games have been quite popular for a long time, and devoted players would do anything to get new, dazzling armor or a special character, even buying an NFT. A virtual in-game object that has been changed to NFT cannot be removed or altered in any way, guaranteeing the player's ownership.

  Additionally, as in-game items are NFTs, they might have special qualities that no other item in the game has. This increases the level of anticipation among players who desire to possess the item or use it to succeed.

  Like other NFTs, in-game items are only as secure as the platform they're on. If the platform is compromised, NFTs can end up in the wrong hands.

- Collectibles and trading cards

  Before the NFTs were well-known, people began collecting cards. Nowadays, purchasing a rare NFT card has replaced gathering actual cards. Only the technology has changed; the cards themselves have not. Furthermore, once a person receives the card they were looking for, they are aware of its exclusivity and can decide whether to keep it or sell it.

  Furthermore, provided it is properly prepared and submitted to the marketplace, any item that can be considered a collectible can be sold as an NFT.

  Hackers may employ some inventive tactics to capture their target when it comes to collectibles. Ape NFT’s wallet was accessed by hackers using a screen-sharing program, and they deleted his whole collection.

- Sports memorable moments

  NFT technology can be used by sports fans to plan and promote remarkable athletic events. These are short films showcasing some of the biggest sporting events, such touchdowns that win games or dunks.

  These films, which last about ten seconds, could sell for up to $200,000. Along with the greatest sporting events, there are sports NFTs that include actual artefacts that attest to the item's authenticity.

  Both the website and the owners of the great sporting events are responsible for their safety. These NFTs are vulnerable to theft if the owner makes a mistake, or the platform is attacked.

- Memes

  Memes are widely available online and can be found in NFT marketplaces as well. Additionally, the NFT is occasionally sold by the individual shown in the meme, making it even better to purchase and possess.

  Popular NFT memes include Nyan Cat, Bad Luck Brian, Disaster Girl, and more. From $30,000 to $770,000, these are priced, with the Doge meme reaching $4 million.

  No one can take a JPEG and sell it as an NFT because the original will remain on the platform, which is similar to how it is with digital art in terms of meme NFT security.

- Domain names

  One of the strangest products on te NFT market might be domain names. On NFT markets, however, they are quickly turning into commodities. A recent example of a domain name that sold for a high price of $100,000 is win.crypto.

  The domain name is typically registered with a third-party management company. On the other side, the NFT marketplace eliminates the middleman and provides direct domain ownership. Additionally, since the domain is only purchased once, there is no need to pay a renewal fee.

  Since NFT domains are stored in a cryptocurrency wallet, they behave exactly like any other wallet money. NFT domains aren't entirely safe, whereas crypto wallets can be compromised.

- Fashion in the virtual world

  NFTs have established themselves in several sectors, including the fashion industry. The experimentation with virtual fashion by Gucci, Reebok, and Puma brings us one step closer to the creation of NFTs.

  Several fashion NFTs also have a connection to a physical thing. For instance, the NFT-based fashion company Overpriced recently unveiled a real hoodie with an NFT code.

  In the event, this hoodie is stolen, the business will send the owner a replacement with a new NFT code and will invalidate the original.

- Other online resources

  The number of items that can be turned into non-fungible tokens will probably increase as the NFT market expands. Similar to what Jack Dorsey accomplished with his tweet, anyone may soon be able to sell their articles.

  NFTs are a new trend, therefore their popularity and usefulness will undoubtedly increase, and markets will continue to be open for whatever new products individuals wish to offer.

  The same rules apply to other online items that can be converted to NFT. These are safe in the wallet if the owner doesn't compromise it. However, the current owner must rely on the platform's security if the NFTs are for sale.

  When someone discusses NFTs, art immediately comes to mind. But, NFTs go beyond that. These distinctive tokens can be used to prove ownership of the purchased item. This makes room for the sale of various goods, like clothing, collectibles, and even memes. Since NFTs are based on blockchain and almost everything can now be digitized, we might soon see more products on the market and a longer list of things that might turn into NFTs.

  NFTs are typically regarded as secure. On the other hand, their owners are responsible for making sure they stay that way. One strategy is to select the most secure site for selling NFTs and avoid giving anyone else access to your sensitive wallet information.

Understanding NFTs’ possible threats

The following are NFTs’ possible threats:

- Cyber security

  An NFT has contributed to fraud and cybersecurity incidents. Black-hat hackers now find it simpler than ever to exploit the system thanks to new technologies. Many hackers like creating fake stores that can mimic the NFT store's branding and offerings. Since there can only be one NFT, copyright issues may arise if these knockoffs were portrayed as the real deal and sold. This would lead to a user buying a fake NFT. In October 2021, Facebook announced a redesign and the creation of a Metaverse. The growth of the digital world, blockchain technology, and the metaverse led to the emergence of the digital asset known as NFT.

- Identity fraud

  The frequency of artists' works being sold as NFTs without their permission has significantly grown. Scammers have set up a large number of unauthorized customer service channels and social media accounts to sell counterfeit NFTS under the guise of authorized NFT exchange artists. They steal customer data and compromise their accounts in the process.

- Vulnerabilities in the smart contract security

  Smart contracts are self-executing programs that automatically enforce the rules and regulations of a particular transaction. They run on the blockchain, making them immutable and transparent. However, despite the many benefits of smart contracts, they are not completely immune to security vulnerabilities.

  Here are some of the most common vulnerabilities in smart contract security:

  - Reentrancy attacks: A reentrancy attack occurs when a smart contract is written in such a way that it allows an attacker to repeatedly call the same function before the initial function call completes, which can result in the attacker stealing funds or causing other types of malicious behavior.
  - Integer overflow/underflow: Smart contracts can be vulnerable to integer overflow/underflow, which occurs when a value exceeds its maximum or minimum limit, causing the contract to behave in

unexpected ways. This can be exploited by attackers to steal funds or cause other types of damage.

- Unauthorized access: Smart contracts can also be vulnerable to unauthorized access, where an attacker is able to access and manipulate data or functions that they should not have access to.
- Logic errors: Logic errors occur when there are flaws in the way a smart contract is programmed. These can be difficult to detect, but they can allow attackers to exploit vulnerabilities in the contract to steal funds or cause other types of damage.
- External calls: Smart contracts that make external calls to other contracts or external data sources can also be vulnerable to attacks if the external source is not secure or if the contract is not properly written to handle the external calls.

- Editable metadata

  It is possible to classify and identify aspects of the data it provides using metadata, which is organized reference information. Since the prefix "metadata" often suggests an underlying definition or description, NFTs are digital assets that contain metadata that describes them. By altering its metadata, an NFT's rarity component could be lost, and it could lose value. Now, a collector has a justification for not buying the NFT collection. It is like overlaying the well-known Mona Lisa with a portrait painting.

- Valuation challenge

  To maximize their profits, NFT owners may oversell a product. The other collectors will suffer because of the value decline.

- NFT as a security

  When the **Securities and Exchange Commission** (**SEC**) asked for information on specific NFTs, it was a red flag for the NFT market. According to Cointelegraph, the cryptocurrency trading platform BlockFi was penalized $100 million for misrepresenting high-yield lending products as securities.

Possible NFTs security solutions (how to secure NFTs)

Potential NFTs security options include the following:

- Multi-factor authentication

  To gain access to a website or application using this electronic authentication method, a user must successfully present two or more pieces of evidence (codes or factors) to an authentication system.

  An NFT user account can be easily accessed by a hacker due to the lack of multi-factor authentication. Since **Multi-factor authentication** (**MFA**) prohibits unauthorized parties from accessing user data, it tends to decrease criminality.

- Ensure that the password for your account is unique

  Large tech companies emphasize the need of using a secure and distinctive password. NFT websites require you to create strong, memorable, and distinctive passwords. For instance, Jt5e-79P-B13qS. To create a unique and safe password, use odd characters, uppercase, lowercase, and a combination of digits. For NFT wallets or any other website, never use more than one password that has the majority of the same characters.

  Using passwords like Drakeyoungmoney34 or Drakeyoungmoney43, for instance, makes it easier for hackers to guess them. Keep in mind that if one of them is compromised, they are all at risk. Instead of storing your password on a website that can retrieve it, write it down on a piece of blank paper. You can use it to protect your NFTs and bitcoin wallets.

  Refrain from downloading unauthorized files and responding to unwanted communications.

  All of us have received emails marketing goods or documents. The emails usually look too wonderful to be true because they are unsolicited. It is best to avoid engaging with strangers because emails and QR codes are regularly known to carry harmful spyware or viruses. This could lead to a stranger compromising your account by intercepting your password, screen mirroring, stealing your NFT, or stealing your identity.

- The openness of smart contracts

  A smart contract is a computer program or transaction protocol that, in accordance with the terms of the contract or legal agreement, automatically executes controls, or documents legally significant events

and actions. Smart contracts are utilized in NFT transactions and constitute the core of any NFT platform. Since smart contracts eliminate the outcome with third parties enforcing and boosting trust in blockchain technology, many firms use them in their everyday operations.

- Regularly update your software

  The future of NFTs and the escalating security concerns are looking more promising over time. You must make sure that the NFT software runs without a hitch by consistently updating to the most recent version of the program that is readily available for your device. The problems with the driver software will be resolved following the latest update. As a result, cyber risks are reduced.

- Secure online access

  You must secure your home internet connection if you want to protect yourself from online threats and have online peace of mind. It makes it less likely that hackers will gain access to your NFT accounts and hardware wallets.

Software and hot storage crypto wallets

There are many different hardware and software setups for wallets. The top NFT wallets at the moment of writing this book, include the following:

- As an illustration of a hot wallet that supports NFT and allows bitcoin sales, thinks about Coinbase. It is the ideal option for individuals who are just getting started with NFTs due to its user-friendly design interface and simplicity of use.
- The Enjin Wallet is the best location for organizing both your cryptocurrency and NFTs in one location.
- Using AlphaWallet, which uses web 3.0 technology, you may manage your tokens. Additionally, you can import your previous wallets without downloading any software or safeguarding your secret key.
- The Ethereum network can be accessed through the blockchain software gateway and cryptocurrency wallet known as Metamask. It is a well-liked, practical, and secure way to manage your Ethereum-based tokens with over 21 million users.

Hardware and cold crypto wallets

The ability to store your cryptocurrencies and NFT offline is provided by hardware wallets. It is a method for preserving the secrecy of your private keys. The following are some of the most popular hardware wallets:

- **Ledger Nano X**: The Ledger Nano X is a safe, Bluetooth-enabled, large-capacity, and user-friendly gadget for cryptocurrency owners. When linked to the Ledger Live mobile app, it performs optimally. More than 1300 different forms of cryptocurrency can be sent and received, and it supports several desktop and mobile operating systems. Inside the hardware wallet chip, it stores up to 100 programs, including Bitcoin, Ethereum, and Bitcoin Cash.
- **Trezor**: Ledger Nano X-like functionality and compatibility are offered by the Trezor One device for more than 1000 assets. Despite the limitations on a few currencies, NFTs, and the absence of Bluetooth capabilities, Trezor and Ledger Nano X both feature additional higher-end devices. The PIN protection directs you to their start page during account setup. It provides even more security and nudges you toward utilizing 2-factor authentication to validate your transaction.
- **Titan by ELLIPAL**: ELLIPAL supports more than 10,000 tokens on 41 distinct blockchains. Additionally, it is waterproof and dustproof thanks to its IP65 classification. You may access exchanges and manage your accounts with a smartphone.

The future of NFTs

Despite the risks, NFTS are widely used by people all over the world. Many companies, including artists, are entering this expanding sector in an effort to profit from it. Mark Cuban wants to introduce NFT ticketing to NBA so that buyers will have lifetime access to first-row seats for their tours because the market for metaverse galleries is booming.

The NFT market is quickly changing. With over $4.8 billion in sales on OpenSea, the NFT industry will prosper and soar to new heights. NFT has a promising future, and the market will grow quickly.

Re-entrant attack

Without a doubt, smart contracts and blockchain technology have a wide range of uses. Although smart contracts have many benefits, they can also be vulnerable. Attacks could happen, for instance, when the product is still being developed. We will concentrate on one specific threat attack on reentrancy smart contracts. We will start off by discussing the fundamentals by answering the query, "What is reentrancy?" Further, we will take a look at several reentrancy smart contract example assaults once you have learned the foundations. The question of how to protect yourself from reentrancy assaults may now be on your mind. Avoid letting the unsettling idea of uncertainty deter you from pursuing a job as a blockchain developer.

To help you understand the idea better, we will take on a reentrancy smart contract sample project ourselves. You will be able to see for yourself where the weakness is. For thoroughness, we will also address the flaw in our example smart contract by creating a testing dashboard to help enhance our reentrancy smart contract example. You will get the chance to take Moralis' ultimate shortcut here (also known as, Firebase for crypto). Three solutions to our reentrancy smart contract scenario will also be discussed. In addition, We will use MetaMask and Remix, both of which are fantastic tools. Let us understand what precisely is reentry attack is in *Figure 7.2*:

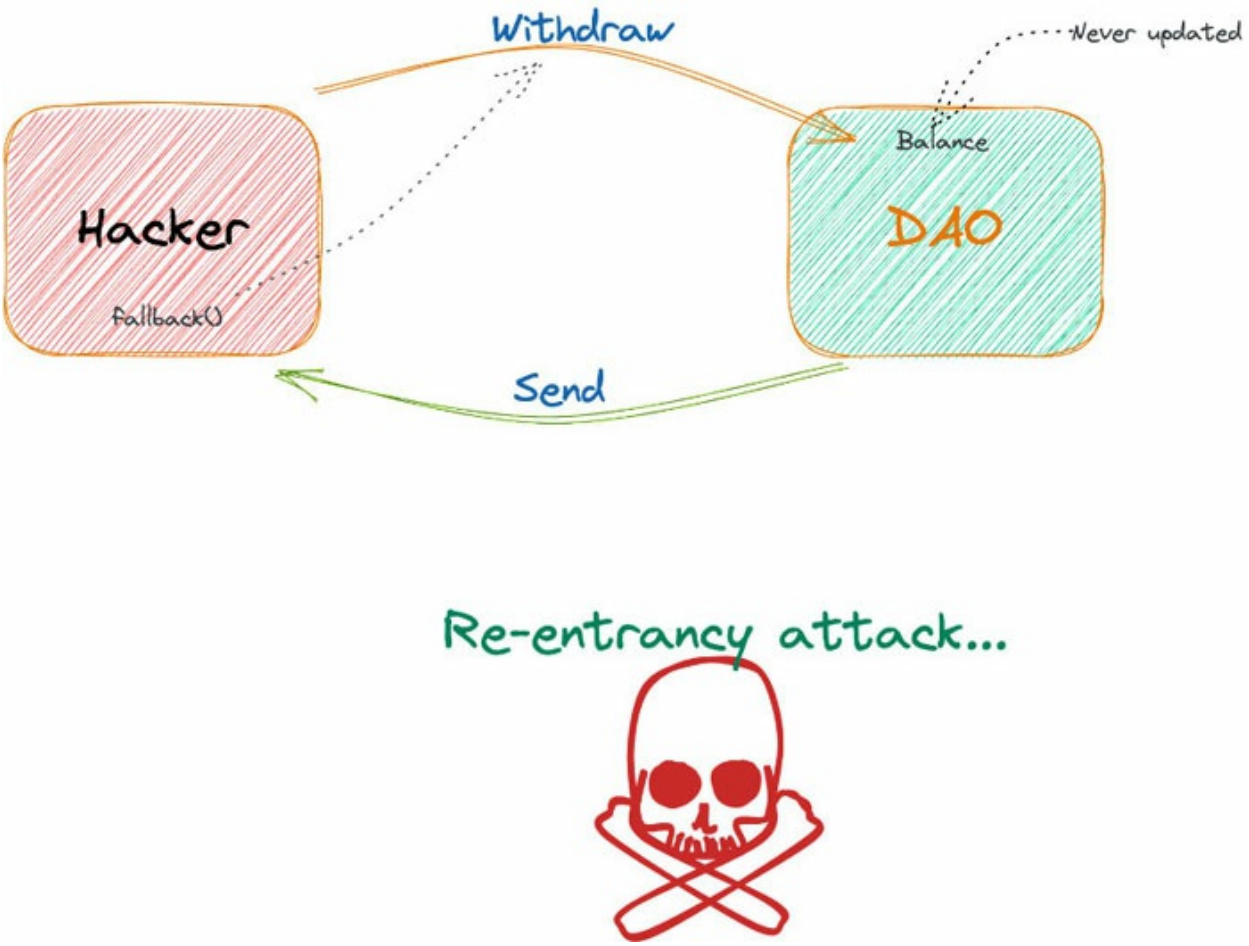

Figure 7.2: *Re-entrant attack*

The definition of the word "reentrancy" is "the act of entering again (reentering)". Reentrancy is a fallback function that is specified in Solidity technically. The fallback function often calls the external smart contract repeatedly until the function is successfully executed. This might be abused by hackers to use a hacking smart contract to call an external function in the original smart contract, which could drain the remaining cash if it was a withdrawal function. On the other hand, the phrase is used in the realm of computers almost entirely. Reentrant software or a subroutine, in this sense, enables numerous safe concurrent invocations or requests (either on multiple processors or on a single processor system). In such systems, a reentrant process may be stopped mid-execution. After the interruption, the operation could be called once again ("reentered") before the prior invocations are finished. Reentrancy can be advantageous in some circumstances, as the preceding definition shows. This might be a significant drawback with smart contracts, though.

Let us discuss the question of "what is reentrancy?" in the context of smart contracts. Every time a smart contract makes an external call to another smart contract, a reentrancy attack could happen. Additionally, if a smart contract makes an external call, the calling smart contract transfers control of the EVM execution to the called smart contract. As a result, there is a danger unless the smart contract making the call has a full understanding of the called smart contract's code. The so-called smart contract may use the external code however it pleases.

Additionally, the reinsert call can exploit any bugs in the initial smart contract. These flaws manifest when the initial smart contract is incorrectly updated at the time of its call. This makes it understandable why these exploits are referred to as reentrancy smart contract attacks.

Smart contract reentrancy attacks

There have been numerous reentrance smart contract attacks over the past few years. While attacks of this nature caused the most controversy in 2016, they occurred often in 2015. Some of the most well-known reentrancy smart contract example hacks include the following:

- The most well-known Ethereum attack is The DAO Hack, which happened in 2016. Unfortunately, the transfer mechanism of the DAO's smart contract was set up to move ETH to an external address before changing its internal state. It, therefore, indicated that the balance had been transferred before. With the latter, the attackers were able to abuse reentrancy and extract more ETH from the contract than they were legally permitted to.
- **Uniswap/Lendf.Me**: In April 2020, $25 million was stolen due to this reentrancy hack.
- **Cream Finance**: In September 2021, this DeFi technology experienced a significant setback.
- **BurgerSwap**: This **Binance Smart Chain** (**BSC**)-based token swap system was attacked in May 2021. Using a fake token address and a reentrancy weakness, the attackers were able to steal tokens valued at about $7.2 million.
- **SurgeBNB**: This $4 million reentry attack should also be noted. It took place in August 2021.

- **Siren Protocol**: In September 2021, hackers were able to steal $3.5 million worth of tokens from AMM pools by exploiting the reentrancy flaw.

These are only a few of the most well-known smart contract reentrancy attacks. Furthermore, the dates of most assaults revealed that many teams do not pay enough effort to the problem of "reentrancy." As a result, the DAO hack's five-year-old lesson has the propensity to repeat itself. However, you will be on the safe side if you take this information carefully.

Example of a smart contract for reentry

Now that you know what reentrancy is and why these attacks are not just a thing of the past, it is time to take on an example project. As a result, you will see the weakness clearly. For the sake of this test project, we will be working on the Avalanche testnet using SnowTrace, which is Etherscan or BscScan for Ethereum's BSC version.

Following its placement on the Avalanche testnet, the following is our risky contract:

The most serious vulnerability

The main risk is that this reentrancy smart contract sample accepts addresses as function arguments:

```
function deposit(address _beneficiary, address _approver) external payable
```

The latter is especially dangerous because it enables an external contract to perform services that we do not want it to. Additionally, by sending the execution of the EVM to the external smart contract using the "`withdrawFunds`" function (as shown below), we open ourselves up to reentrancy attacks:

```
(bool result,) = caller.call{value: escrowRegistry[_escrowID].amount}("");
```

To put it another way, the "`withdrawFunds`" method may be called one more by the external smart contract. If this is done before the state of our smart contract is altered, the reentrancy attack will be successful.

Taking advantage of our smart contract

You will be able to understand the issues with our reentrancy smart contract sample here. A smart contract deployment tool like Remix can be used directly. The smart contract example from earlier can serve as a guide. We can therefore quickly draw a new contract that takes advantage of the flaws in our "unsafe" one.

Perform the following procedures to benefit from our first smart contract after the "attacker" contract has been activated:

1. The victim's contract should receive very little amounts of tokens. To access our interface, we will utilize SnowTrace. Here, we declare ourselves to be the approver and input the beneficiary's address.
2. Using the funds delivered in the previous stage, we carry out the "attack" action within the "attacker" contract. After that, the "withdrawFunds" function will be called. You already know that function can be executed externally, therefore we can benefit from it. Therefore, reentrancy is crucial in this instance. The withdrawal will be made regularly until the monies are gone, as per our "attacker" contract.
3. The final step is to transfer the stolen funds to a new account.

Fixing the problems

The solution to the reentrancy issue was illustrated in the previous section. The attacker need not be a highly skilled individual. All that is required are openly available technologies like Web3 wallets, blockchain scanners, and platforms for deploying smart contracts. Consequently, having the ability to correct this kind of inaccuracy is crucial.

Reentrancy attack: A significant problem

Even though reentrancy attacks have been around for the last two years (2020-2021), there have been instances of them, such as:

- The $25 million Uniswap/Lendf.Me hacks (April 2020), which were carried out by hackers using reentrancy.
- A reentrancy vulnerability and a fake token contract caused the BurgerSwap hack (May 2021) to cost $7.2 million.
- The $4 million SURGEBNB hack (August 2021) seems to be a reentrancy-based price manipulation attack.

- A reentrancy vulnerability was employed in the $18.8 million CREAM FINANCE hack (August 2021) and was successfully exploited by the attacker.
- The $3.5 million Siren Protocol Hack in September 2021 involved reentrancy attacks on AMM pools.

Working of a reentrancy attack

A reentrancy attack involves two smart contracts. A vulnerable contract and an untrusted attacker's contract.

Reentrancy attack scenario

1. The weak smart contract has 10 Ethereum.
2. A hacker stores 1 eth via the deposit method.
3. An attacker calls the withdraw function while using a malicious contract as the beneficiary.
4. The withdraw feature will now confirm that it can be utilized as follows:
    a. Is there a single Ethereum in the attacker's account? Yes, because of their deposit.
    b. Send 1 eth with a malicious contract. (Note that there hasn't yet been a change to the attacker balance.)
    c. Withdraw function again after the fallback function receives eth calls.
5. The withdraw function will now check to see whether it can be used:
    a. Does the assailant have one Ethereum in their account? Because the balance hasn't been adjusted, the answer is yes.
    b. Send 1 ether to a malicious contract, then do so again and again until the attacker has drained all the money on the contract.

The contract, which reveals the reentrancy vulnerability, is given as follows:

```
contract DepositFunds {
  mapping(address => uint) public balances;
  function deposit() public payable {
    balances[msg.sender] += msg.value;
  }
```

```
  function withdraw() public {
   uint bal = balances[msg.sender];
   require(bal > 0);
   (bool sent, ) = msg.sender.call{value: bal}("");
   require(sent, "Failed to send Ether");
   balances[msg.sender] = 0;
  }
}
```

The vulnerability is present at the point where we send the user the necessary amount of ether. In this case, the attacker employs the function **`withdraw ()`**. Because his balance has not yet been reset to zero, even if he has already received tokens, he can still transfer them.

Let us picture a malicious attacker writing the ensuing contract right now:

```
contract Attack {
  DepositFunds public depositFunds;
  constructor(address _depositFundsAddress) {
   depositFunds = DepositFunds(_depositFundsAddress);
  }
  // Fallback is called when DepositFunds sends Ether to this
  contract.
  fallback() external payable {
   if (address(depositFunds).balance >= 1 ether) {
    depositFunds.withdraw();
   }
  }
  function attack() external payable {
   require(msg.value >= 1 ether);
   depositFunds.deposit{value: 1 ether}();
   depositFunds.withdraw();
  }
}
```

The attack function calls the withdraw function of the victim's contract. Once it has the token, the fallback function uses the withdraw procedure. Once the check is successful, the contract sends the attacker the token, activating the fallback mechanism.

Protecting smart contracts against a reentrancy attack

To protect your Solidity smart contract from a reentrancy attack:

- Ensure that all state changes, such as updating internal balances or code before invoking external code, take place before executing external

contracts.

- Use anti-reentry function modifications.

Modifier to prevent a reentrancy attack

To prevent a reentrancy attack in a smart contract, one commonly used approach is to implement a modifier called "nonReentrant". This modifier can be added to functions that may be vulnerable to reentrancy attacks.

The "nonReentrant" modifier works by setting a boolean flag to true when the function is called, which prevents the function from being called again until the first call has completed. Here is an example implementation:

```
bool private isLocked = false;
modifier nonReentrant() {
  require(!isLocked, "Function is locked");
  isLocked = true;
  _;
  isLocked = false;
}
```

In this example, the "nonReentrant" modifier checks if the boolean flag "isLocked" is false before allowing the function to proceed. If the flag is true, the modifier will throw an error message indicating that the function is locked.

Once the modifier has passed the check, it sets the flag to true to prevent any further calls to the function until the current call has completed. After the function completes its execution, the modifier sets the flag back to false, allowing the function to be called again.

By using the "nonReentrant" modifier, smart contract developers can prevent reentrancy attacks and ensure that their contracts are secure.

Blockchain-related issues

Blockchain technology has a number of problems that prevent widespread adoption. They are as follows:

- Protection

  Blockchains are only as secure as their weakest link, regardless of how safe they might seem to be. For instance, all it takes to access the shared data on a private blockchain is one node.

This implies that a blockchain's privacy is in jeopardy since it uses the most vulnerable technology. Sadly, blockchain technology also has additional dangers.

While it is almost impossible to fake a transaction in a blockchain, it is not impossible to have a false transaction accepted.

- Identification proof

  Technology based on blockchain is highly democratic. To reach an agreement, they vote in a variety of ways. Each node with an identity is given a vote in this scenario. The majority has the final say! Consensus methods that rely on identity verification have drawbacks, such as the exclusion of minorities or interference with smaller blockchain networks.

  Gangs of criminals can easily buy additional votes by entering a blockchain using a variety of means. They can authorize any transaction as soon as they have a majority.

- Proof of stake

  This one concentrates on blockchain users. Depending on how much stake you have in the blockchain, your vote has value. In other words, if you own the majority of the assets on a blockchain, you have complete control.

  When a group purchases more than 50% of the assets on a blockchain, it is said to be under their control.

- Transparency

  The application of blockchain technology to supply networks has generated a lot of debate. It appears to be a fantastic idea! Creating open supply chains can, after all, give everyone the closure they need to make moral decisions. However, it is not always a good idea to use a public blockchain in a professional setting. Why? Since an open supply chain gives everyone who does business with an organization access to transparent data. In a corporate setting, complete transparency is inappropriate since it enables parties to see each other's activities in real time.

  Customers do not want their data to be shared with all supply chain organizations, and businesses do not want their competitors to learn about their trade secrets, intellectual property, or business plans.

- Scalability

  As a blockchain gets bigger, its vulnerability increases. There is still more to talk about before you implement blockchain in your business if it isn't enough to convince you. Because of their redundant nature, blockchains are challenging to expand, every transaction needs to be repeated across all of your network's devices. That amounts to hundreds of copies of the same data! It requires a lot of storage, and the nodes will need more processing power as the blockchain gets bigger.

  It will be difficult to regulate your blockchain even if all your digital, software, and hardware needs are met.

- Regulation

  Because of the network's decentralized administration, there is no single authority in charge of maintaining law and order. There isn't even a governing body, let alone moderators or leaders! Not to mention the fact that most countries do not recognize smart contracts (contracts made on a blockchain) as valid agreements or proof.

  In addition, given that each user may be from a different country and that blockchain crosses all boundaries, which laws should be applied to smart contracts, agreements, transactions, and cases?

- Consumption of energy

  Blockchain technology uses less energy than any centralized system. In addition to using more energy than a normal centralized cloud-based system due to their redundancy, they also have a transaction validation mechanism that is very important.

  For starters, they require more storage than any other system. The amount of electricity needed multiplies as more nodes are added to a blockchain. Every node stores and processes almost as much data as the central hub of any other system.

DOS attack

By limiting access, a **denial-of-service** (**DoS**) attack prohibits intended users from utilizing a computer or network. One of the most popular ways for hackers to obstruct the regular operation of computer systems is through DoS assaults. One of the best ways to carry out such an attack is through a

dispersed tactic.

DoS attacks can have several types and structures. In order to fully utilize a network's bandwidth, volumetric attacks rely on flooding it with echo requests. In that, they flood the network with numerous requests, syn flooding attacks are similar to flood flooding attacks; however, the attacker quickly creates a connection to a server without finishing it.

Attacks that fragment networks are designed to prevent the target network from coming back together. Application layer attacks target unidentified code flaws in an application or network by overburdening the victim with requests. Finally, DoS attacks aim to permanently harm the target network by sending out phoney update requests and injecting malware.

Distributed denial-of-service (**DDoS**) attacks are the most common type of malware assault. Hackers infiltrate networks of connected devices with malware, and then bombard them with a massive number of requests to overwhelm the network. This is known as a DDoS attack, as shown in *Figure 7.3*:

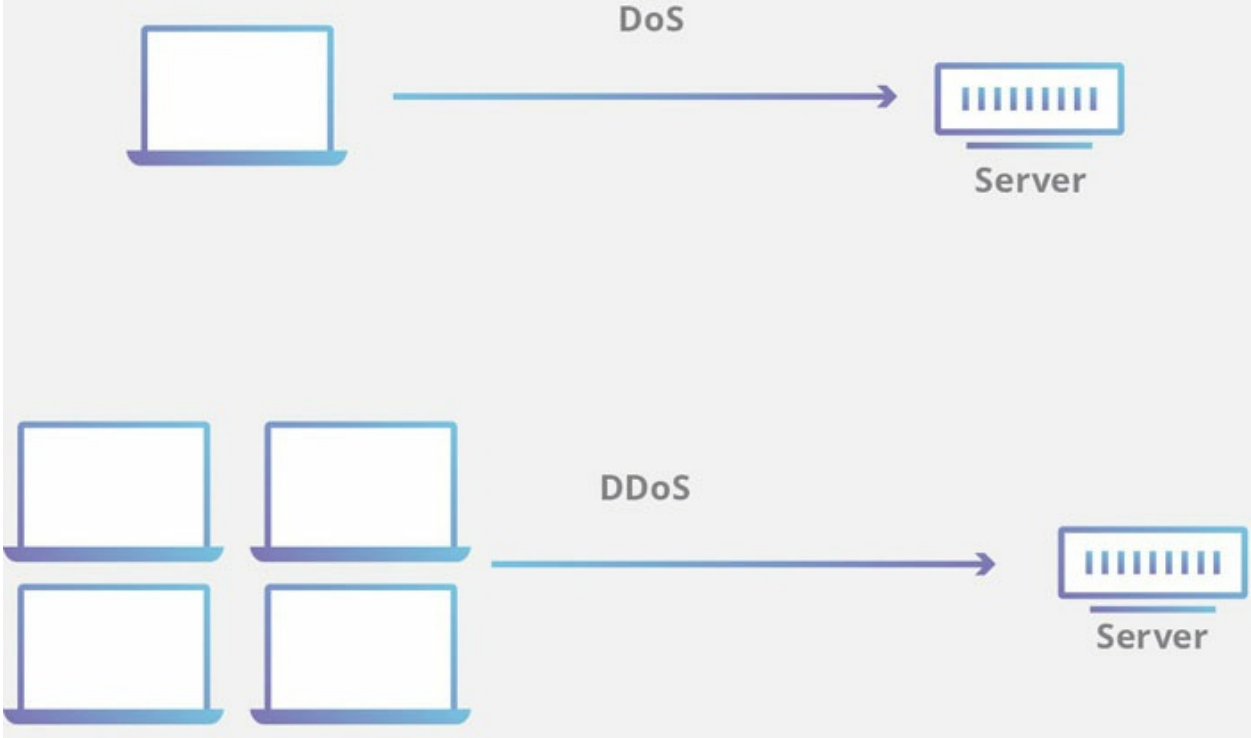

Figure 7.3: *Dos- DDoS attack*

Bitcoin exchanges have become increasingly popular, making them a common target of DDoS attacks. Since 2020, many DDoS attacks have been

launched against some of the main cryptocurrency exchanges. The exchange's services will, regrettably, be unavailable for a considerable amount of time as a result.

A new type of DoS attack called **blockchain denial-of-service** (**BDoS)** attack has evolved with the introduction of blockchain-based applications. These attacks target blockchains, including Bitcoin's, that employ the proof-of-work consensus algorithm.

This brand-new DoS works by attacking the miners' incentive structure. For the PoW consensus technique to work, miners must validate new blocks; if miners do not receive incentives, block validation is interrupted. It is important to note how much more challenging it is to launch a successful DoS attack on a decentralized network. DoS attacks frequently rely on the centralized nature of traditional networks, whereas blockchain-based networks cannot use this tactic. Attackers send false proof of their mining advantage to the blockchain in an attempt to sabotage the mining operation. This discourages other miners from performing the tasks necessary for transaction confirmation, hence reducing the blockchain's processing power.

So, in a DoS attack, a malicious attacker tries to render a server inaccessible to the users for whom it is meant by upsetting normal operations. DoS jeopardizes the NFT service’s availability and makes it accessible to unauthorized users. The blockchain, fortunately, makes sure that users’ activities are always accessible. Legitimate users can provide the necessary data when it’s required, and human error won’t result in data resources being destroyed.

DoS attack example

A new NFT Marketplace called LooksRare has been unveiled. The platform wants to index all NFTs on the Ethereum blockchain and describes itself as a community-focused marketplace.

Trading activity in the NFT region hit $20 billion last year, making it a sizable market. But OpenSea has mainly controlled the market, accounting for almost $14 billion in sales in the previous year. LooksRare appears committed to reversing that.

- LooksRare Targets OpenSea Users

The new marketplace has already begun carrying out its concept. It was created by two unidentified co-founders and a group of nine technologists. It aims to attract users by using its native LOOKS token. The token has been traded on Uniswap.

It aims to entice major NFT spenders from OpenSea by providing them with LOOKS gratis. Anyone who transacted more than 3 ETH on OpenSea between June 16 and December 16 of 2021 is eligible to receive the tokens.

LooksRare is not the first party to try what is referred to as a "vampire attack" on OpenSea, which entails stealing current users. Another NFT marketplace, Infinity, gave it a chance after making its debut in October 2021.

LooksRare aims to draw new OpenSea users in addition to rewarding users each time they trade an NFT. Additionally, there will be rewards for those that stake the LOOKS token, and an APR of 30,400% is promised. It also seeks to entice more customers with its lower 2% regular fee.

- LooksRare Suffers DDoS Attack

  The LooksRare website was unusable for hours after it went live due to a distributed denial of service (DDoS) attack. Some users admitted that they were unable to list their NFTs and connect their wallets. The team quickly restored the website’s functionality, but it was later discovered that the wallet issue still exists, and some users are still experiencing tethering issues.

- In 24 hours, NFT Tokens lost 3.5% of their market value

  Although the trading volume on OpenSea has surpassed $2 billion in the first ten days of 2022, there hasn't been a green run for NFT tokens despite the increased interest and trading activity in NFTs.

  Among the top 10 NFT tokens, only Ecomi's OMI token saw a price increase of less than 1% the day before, according to the Coingecko data.

  The top NFT tokens AXS, SAND, GALA, ENJ, and MANA all had losses of 2–6% throughout the same time period.

  Additionally, the market value of tokens in the region dropped by almost 4% over the previous 24 hours.

Spoofing

Spoofing has to do with authenticity and refers to the ability to simulate another system entity (such as a human or a computer). A hostile attacker may utilize authentication weaknesses or the user's private key to illegally transfer NFT ownership when a user interacts with, mints, or sells NFTs. Users can protect their identities from being falsified by third parties by storing their private key pairs in cold wallets.

Non-fungible tokens have the potential to be incredibly valuable assets that need to be constantly protected. One risk to be aware of is the spoofing of NFTs. Self-defence is simple, yet the threat is greater than one might think and more immediate. *Figure 7.4*, shows the spoofing attack:

How IP Spoofing Works?
Attacker
Fraudulent request for data appearing to come from victim
Server
Server thinks request is genuine and sends large amounts of data to victim
Victim

Figure 7.4: *Spoofing attack*

There are various things to consider while working with non-fungible tokens. Research on tokens, creators, artists, use cases, and even marketplaces must be done in-depth. All these factors will help you decide whether the thing you want to buy is worth it, but market success is never a given.

Many individuals are drawn to NFTs because of their pricing potential. Several well-known collections, such as CryptoPunks and Bored Ape Yacht Club, have offered prizes to early investors. Nevertheless, there are hundreds of short-term failures for every successful collection.

Unfortunately, there are a ton of other problems that might arise. One such issue is NFT spoofing. A very common tactic is to create fake NFT stores for markets that are exact replicas of existing projects. Even though the attackers aren't interested in login information, it is comparable to phishing websites. Instead, they'll trick gullible individuals into purchasing pointless art.

Many countries, notably the United States and the United Kingdom, forbid spoofing. Unfortunately, it is still one of the biggest threats to a range of enterprises, including NFTs. The main factor to take into account while buying, selling, and trading non-fungible tokens is emotion. As many people attempt to sway prices for their own gain, this makes for an ideal environment for spoofing activities.

Bots continue to be a big problem

Most individuals have seen a trend in the NFT industry where bots prefer to raise prices or attempt to push markets lower at inconvenient moments. This kind of financial scamming is fairly common on platforms like OpenSea. Bots will make low-priced offers on NFTs, and some users, especially those who require liquidity, might be persuaded to accept the offer even if it results in a loss-making sale.

Sadly, a lot of people buy NFTs with the idea of selling them within a day or less. If that approach doesn't work, they are willing to take a loss and go on to other projects.

It is wonderful that the bulk of offers will never be accepted. Bots may place these bids quickly and in large numbers. As long as one of the offers is ultimately accepted, a high failure rate is unimportant. It will be challenging to eliminate bot-related operations because there is no regulation in blockchain, especially not in the NFT space.

One thing to remember is that the bot may still cancel a bid even if someone accepts it. It reduces the floor price for the NFT collection, forcing the owner of the bot to utilize their real account to place an even lower bid. Even though cancelling bids cost money and there is a chance of obtaining NFTs for much less, some may find this technique to be unprofitable. If the results continue to be profitable, this trend will last for a while.

Navigating the non-fungible token market may seem challenging considering the aforementioned, but there are ways to keep customers safe. The team at EverdreamSoft has developed a multifaceted plan of action to combat NFT spoofing. The first "tool" is the Orb Explorer, which enables you to view your NFTs across wallets and chains and to learn more about any tokens you're interested in. Additionally, it provides a search engine for NFT collections and places to buy them, ensuring that customers can find

dependable and reputable vendors.

Second, EverdreamSoft is creating new tools for indexing current and upcoming blockchain content. The business wants to become the "Google of tokenized assets," with a big emphasis on NFTs. It's a great option for prospective buyers and advantageous for producers, too. Artists can pay to have their work promoted, encouraging good behavior and removing any doubts.

Information leakage

Information leaks occur when private information is disclosed to unauthorized parties or individuals. Any simple review of news sources will show that data breaches happen far too frequently. Unsurprisingly, your business may experience a large financial loss if the information on project negotiations or tender information is leaked.

Even if it might not seem like it, information breaches often have unintended effects on your business. The disclosure of confidential client information could harm your business's standing in the marketplace. Customers won't work with you or give your company their personal information in the future.

Information leaks are caused by several factors:

- Information transfer takes place using insecure tools.
- Employee theft from the company.
- Employee disclosure of private information without authorization.

Compromised NFT accounts draw attention to security flaws built into the design of centralized platforms.

Nonfungible tokens (**NFT**s), which are offered for sale on platforms based on blockchain technology, are being used in a new type of art theft that is occurring around the world. NFTs gained notoriety a few weeks ago when one was sold at Christie's for more than $70 million, according to the auction house, making it the third-highest selling price for a piece of art created by a living artist. Several NFT owners reported that their accounts on a marketplace for digital art had been compromised. While Bitcoin and other cryptocurrencies have been targeted by hackers, this is the first attack on a non-fiat currency (NFT), exposing the typical security flaws built into the design of centralized systems.

The assault, which had a typical design, concentrated on the network's weakest connections. The crooks appear to have mostly used phishing to get user credentials to access the victim accounts in the Nifty Gateway marketplace. As soon as they gained access to the accounts, the thieves either stole the victims' artwork or used credit cards associated with the accounts to buy NFT art, which was later stolen. Since NFTs are stored on a blockchain and blockchain transactions are inherently difficult to reverse, it is almost impossible to return stolen NFTs to their original owners.

The function of private keys

A private key that serves as a guardian for all the assets in a digital wallet governs ownership of NFTs. Anyone who has a private key can access the digital wallet to move and sell NFTs inside of it. NFTs are non-replicable certificates of ownership for any digital asset. Every digital asset has a key as its authentication method; therefore, any loss or breach of the key could prevent the rightful owner from accessing the NFT that it is linked to.

- Hackers target NFT marketplaces and other blockchain-based services.

  Due to the centralized nature of the markets and the high value associated with them, NFTs are sought-after targets. They are vulnerable to ransomware, phishing, insider threats, supply chain attacks, brute-force attacks on login credentials, distributed denial-of-service attacks, and even supply chain attacks.

- A strong defense against account takeover does not exist.

  The blockchain design using NFTs offers two significant security features: immutability and integrity checks. Immutability, which is a fundamental component of any transaction-security strategy, is built into the blockchain architecture. It was developed to serve as a lone source of reality and to promote nonrepudiation, which is essential for action accountability.

  This, however, does not shield the website **against account takeover** (**ATO**), which is a major worry. There is a clear, exploitable problem here since once an NFT has been transferred to someone else's wallet or sold, it cannot be recovered by the sender or a third party. The danger will eventually be concentrated in one area if private keys are used as gatekeepers, creating a single point of failure. Even if an attacker uses a

cunning, usually quiet, and slow-rate assault to get past such defenses, increasing the level of defense by using defense in depth could not be a foolproof solution.

Security flaws in NFTs must be fixed

The NFT industry suffers from a widespread lack of security expertise, which needs to be addressed to prevent further incidents. Despite its potential as a security enabler for financial transactions, blockchain technology has some drawbacks, particularly in terms of storage and attack susceptibility in online wallets. Strong passwords and multifactor authentication are also necessary. According to Nifty Gateway, none of the affected accounts had two-factor authentication turned on, and actual account credentials were used to access the accounts.

The following security guidelines must be followed to increase the security of these markets:

- NFTs should be stored in a hardware wallet or distributed across several wallets to lessen the risk of theft. When using hardware wallets, pick PIN codes that are hard to guess.
- Distribute your cryptocurrency holdings rather than keeping everything in one place.
- Ensure that two-factor authentication is enabled for every account on the platform and take into account other security settings (where available) for layered protection.
- Before entering and signing in, marketplace users should double-check the platform website addresses to avoid being tricked by phishing or typo squatting attempts.
- Users should take immediate action if they get any unauthorized device or access notifications from websites involving wallet logins or access.

Tampering

One of the biggest security risks facing web applications is tampering. The act of tampering is the removal or alteration of a resource without authorization. An Internet-based programme that can be accessed through a web browser is known as a web application. A hacker or other malicious

person obtaining access to a website and changing, deleting, or viewing unauthorized files is the definition of data tampering in online applications. By using a script exploit, which involves disguising the script as user input from a page or a web link; a hacker or malicious user can also tamper covertly.

Tampering is used to update or alter files in web programmes, which are frequently used by multibillion-dollar companies all over the world. To remove data or plant a harmful or destructive programme, tampering first appeared in the late 1980s. Since then, it has changed and advanced over time. In the year 2000, hackers were successful in deceiving users of web applications by creating and altering data. Since then, it has been simpler for attackers to interfere with internet programmes because new technology is being developed and released every year.

Different types of data tampering

Data tampering refers to the unauthorized or malicious modification of data, with the intention to manipulate, destroy, or compromise the integrity of the information. Here are some of the different types of data tampering:

- Alteration: This type of data tampering involves changing or modifying the original data in some way, such as altering the values of a field in a database, changing a single character in a document, or modifying the metadata of a file.
- Deletion: As the name suggests, deletion refers to the deliberate removal of data, such as deleting records from a database, deleting files from a system, or erasing specific data fields.
- Insertion: This type of tampering involves adding new data to an existing data set, often with the intention of introducing false or misleading information. For example, an attacker might insert fake records into a database, or add false information to a document.
- Substitution: Substitution involves replacing legitimate data with malicious data, such as replacing a legitimate URL with a malicious one, or swapping a legitimate file with a malicious one.
- Repudiation: This type of tampering involves denying that an action was taken or that data was modified. For example, an attacker might modify a log file to cover their tracks and then deny that they had

accessed or modified the system.

- Masquerading: This involves pretending to be someone else in order to gain access to data or to make unauthorized changes. For example, an attacker might use a stolen login credential to gain access to a system, or impersonate a legitimate user in order to modify data.

Data tampering can have serious consequences, such as data loss, data corruption, and compromised data integrity. To prevent data tampering, it is important to implement appropriate security measures such as access controls, encryption, and regular data backups. Additionally, organizations should train their employees to recognize and report any suspicious activity that may indicate data tampering.

The risks of data tampering

Data tampering results in the exposure of sensitive information, the deletion of files, the listening in on unlawful conversations, and the modification or alteration of crucial communications. The main risks of data manipulation include the following:

- Private conversations may contain information that is kept in the browser cache, which allows a hacker to listen in on important transactions.
- In order to make a SQL Server vulnerable to attack, a hacker must introduce malicious code into strings before supplying them to the server for processing and execution.
- Hackers or attackers may read, modify, or otherwise manipulate the communications of other users.
- If permission is unsuccessful, unauthorized access could lead to the deletion of crucial files.

Data tampering is frequently carried out for business purposes, that is, rival businesses attack one another to obtain vital information about the other, such as sales files or new prototype product projects that are used to the other company's advantage. As a result of the deletion of crucial files needed to keep the business operating on a daily basis, this commonly ends in one company closing down.

How to keep your assets safe

Your NFT assets may also be stolen, the same as Bitcoin assets are stolen from online wallets and exchanges.

An NFT, or "non-fungible token," may be able to store everything digital, including pictures, animated GIFs, music, and video game goods, according to The Verge. An NFT can be made up of only one thing, like a real-world artwork, or it might be made up of several things all in one copy, like trading cards. However, the blockchain can identify the file's owner. With NFTs, you can exchange ownership of unique digital products while also keeping track of who has what using blockchain technology.

Numerous NFTs have seen an increase in value overnight. Digital artist Beeple sold one NFT at Christie's for $69 million, while Grimes sold a collection of ten digital works for roughly $6 million. The fact that NFT platforms have been targeted by hackers trying to steal digital artworks or steal credit card information to buy more is regrettable but not altogether surprising, claims The Verge.

Such breaches are not the result of a hack of the underlying blockchain or the servers hosting the crypto assets, just as it is not a hack when crypto assets are compromised or taken. It would be difficult to compromise the underlying blockchain technology that supports crypto assets, as the hacker would need to corrupt a substantial number of servers to have access to the private keys for those assets.

The online services, networks, and markets that asset owners utilize to buy, sell, or store hacked crypto assets are the ones that hackers instead target.

Protecting against a hack of your NFT

NFT marketplaces like Nifty Gateway do not have control over an NFT once it has been stolen because NFTs are blockchain-based. Therefore, it is unlikely that the users whose collections were taken will be able to find their lost items.

Compared to larger Bitcoin and cryptocurrency wallets and exchanges, NFT markets see far less traffic. One of those platforms typically responds rapidly to recover assets when it is compromised, and in certain cases, it may have insurance in place to recompense victims of theft or breach.

Nifty Gateway encouraged clients to use the two-factor authentication offered on the platform and to never reuse passwords. This was intimated to the users in a letter issued to victims of a breach that occurred in March of this year. Some reports claim that the NFTs utilized in these account takeovers were sold in transactions arranged via Twitter or Discord. It is highly recommended that all Nifty Gateway customers purchase their NFTs from the official Nifty Gateway marketplace.

Even though the two-factor authentication does add an additional layer of security, owners of crypto assets should implement the highest level of security into their devices, apps, and networks. To assist protect a user's surroundings from intrusion, a Wi-Fi router's firmware can be upgraded, unique passwords should be used, and firewalls should be set up.

NFT assets can also be maintained in "cold" wallets, much like Bitcoin and other cryptocurrencies, where the private keys are printed on paper and kept offline in a physically secure area.

Tips to keep your digital assets safe

In the NFT universe, there are many investors, collectors, and creators. Given the volume of money moving through the market and the value that some of these digital assets contain, you might be asking if an NFT can be stolen.

Your NFT might be stolen if you click on any link, reveal your secret phrase, or make a mistake. Technically, your NFT could only be stolen if a hacker had access to your wallet; otherwise, they could simply vanish into thin air.

There are many ways that your NFT could be taken. There are just as many ways to ensure that this never occurs to you. Let us examine the potential vulnerabilities in your NFTs and how to avoid them altogether.

An NFT could be taken

Technically, the most frequent method of NFT theft is user error. An NFT cannot be stolen unless the hacker gets access to your wallet, or you knowingly give your NFT to a hacker. Hackers are intelligent; thus, they are aware of how to persuade others to help them accomplish their objectives.

Therefore, unless you actively allow someone access to your wallet or transfer your NFT to them, it would be difficult for someone to steal your

NFT. Despite this, NFTs are "taken" every day through cunning plans and exploits.

Therefore, how NFTs are stolen and how to avoid placing oneself in a position where you can fall for such frauds should be the question, in my opinion.

NFTs: How are they robbed

Unfortunately, there are numerous strategies used daily to steal NFTs. Some scams are obvious, but others are well planned. That is not to say that only certain people have had their NFTs stolen; both novices and seasoned NFT industry pros have also fallen for scams.

Some of the most well-liked methods, frequently used to steal NFTs are as follows:

- Deception

  Deception is one of the most common NFT frauds on the market. It is a common practice to trick users into sending NFTs or granting access to their wallets. Scammers will routinely message you in your DMs with offers of help or deals that are too good to pass up. That should serve as the initial cautionary flag.

  Many con artists also create fake profiles that resemble well-known industry leaders or companies. Then they approach you with a discount you can't refuse, an offer to fix a problem you've been having, and a link to go along with these offers. big cautionary signal

  The possibility for fraud exists everywhere on the Internet, therefore you must continuously exercise extreme caution.

- Exploitation

  Another popular approach of stealing NFTs is through exploitation. Most often, exploitation results from a contract flaw in an NFT platform, which hackers may then use to steal crypto and NFTs.

  Two examples of exploitations that resulted in NFTs being taken are the marketplaces OpenSea and Treasure. Essentially, hackers were able to change the platform's rules to place an order that resulted in NFTs being sold for incredibly cheap prices, including some for $0.

  The NFTs in question were either currently listed or had previously

been listed but had never been cancelled.

- User-error

  The most common cause of a stolen NFT is user error. If the user had more awareness of these common con games, nearly all stolen NFTs might have been avoided. These errors—clicking on a risky link, purposefully sending your NFT away, or giving a hacker access to your wallet data—can all be avoided.

  What steps can you take to make sure your NFTs are less likely to be stolen? Excellent query; let us talk about it.

Preventing the theft of your NFTs

NFTs understand some of the most common methods scammers use to steal NFTs will enable us to comprehend how to safeguard your NFTs. Here are some essential tips to reduce the likelihood that your NFTs may be stolen:

- Do not reveal your code word.

  It should be said even though it appears clear. Never share your wallet's secret phrase or passwords with anyone. Never reveal the code word for your wallet to anyone, not even your favorite influencer or your grandmother.

- Avoid keeping your secret phrase on your computer or other electronic devices.

  Regardless of how safe you believe your computer or mobile device to be, never keep your passwords or wallet secret phrase on any device. Your secret word will be discovered by hackers, who can then simply access your gadgets. As an alternative, put them in writing and store them securely.

- Never click on links you don't think are legitimate.

  This is very important! Never click on any links you aren't certain about. I do, really. If you click a link and sign any transactions using your wallet, game over!

- Keep others from using your screen.

  Scammers frequently target people who are weak. Just be careful that anyone asking to see your computer screen is probably trying to trick

you. Never give the access of your screen to anyone or any company.

- It's usually true if a bargain looks too good to be true.

  You have to hear it even though you might not want to. Anything that someone offers you that seems like a good deal is actually a good deal for the con artist rather than for you. Never take any random offers seriously, especially if you need to connect your wallet or make a purchase.

- Activate two-step verification.

  You should always enable the two-step authentication on all platforms and gadgets you use. For every new layer of security added, hackers, and scam artists must climb yet another obstacle. construct as many walls as you can.

- Safeguard NFTs with a hardware wallet.

  If you intend to hold NFTs for any period of time, a hardware wallet is a necessity. Hardware wallets protect all your private data, including your secret phrase, password, and pin, offline, lessening the risk of hackers gaining access to your wallet.

- Always carry out your own research

  Before buying an NFT, you should always conduct your own research. Do some study about the artist, the platform, and the surrounding area.

Recovering a stolen NFT

Unfortunately, there is no sure way to get your NFT back if it has been stolen. The blockchain keeps track of everything, thus the good news is that you can follow your NFT even after it has been stolen and find out who did it. The option to file a ticket to OpenSea in order to disable the sale is available. However, it is still not recoverable, and we have no control over the sale on other markets.

Another encouraging point is that even if it was an NFT that was taken, you still have legal rights. The Computer Fraud and Abuse Act of 1986, according to NFT Attorney, makes it illegal to access a computer or database without authorization or an excess of any privileges that have already been granted.

This law offers both criminal and civil remedies, so victims who believe they

have lost property or money can sue the con artist separately to get it back.

There is still hope, even though there is no surefire way to get back stolen NFTs. I really believe that it is essential to take the aforementioned precautions in order to avoid getting into this predicament in the first place.

You may not be able to completely guarantee that your NFTs won't be stolen, but you can still take every precautionary measure within your ability to keep yourself as safe and secure as possible.

Conclusion

Since NFTs are registered on the blockchain and connected to your wallet address, proving your ownership of one is similar to proving the accuracy of your wallet's seed phrase.

If you have the digital art source file, you can make a backup of it to guard your copy of the piece from accidental loss or deletion. This is crucial for insurance purposes and for non-traditional art that can go through several different hands, such auction houses, which may be handled by numerous people.

Following that, we talked about re-entrant attacks, blockchain-related problems, denial-of-service attacks, spoofing, information leaks, and tampering. We covered both how to steal NFTs and how to get them back.

In the next chapter, we will learn about how to create, sell, and mine NFTs.

Key terms

- **DOS attack:** Prohibits intended users from utilizing a computer or network.
- **Spoofing:** Ability to simulate another system entity (such as a human or a computer).
- **Information leaks:** It occur when private information is disclosed to unauthorized parties or individuals.

Multiple Choice Questions

1. **NFTs possible threats are:**

a. Cyber security
b. Identity fraud
c. Vulnerabilities in the smart contract security
d. All of the above

2. **Which of the following are the potential NFTs security options?**
    a. Multi-factor authentication (MFA)
    b. Ensure that the password for your account is unique
    c. The openness of smart contracts
    d. All of the above
3. **_____is "the act of entering again (reentering)".**
    a. Reentrancy
    b. Blockchain
    c. Spoofing
    d. DoS attack
4. **Which of the following are the problems associated with blockchain technology?**
    a. Protection
    b. Identification proof
    c. Proof of stake
    d. All of the above
5. **Spoofing can be associated with:**
    a. Authenticity
    b. Blockchain
    c. Stealing of information
    d. Mining NFTs

Answers

1. **d**

2. **d**
3. **a**
4. **d**
5. **a**

Join our book's Discord space

Join the book's Discord Workspace for Latest updates, Offers, Tech happenings around the world, New Release and Sessions with the Authors:

https://discord.bpbonline.com

CHAPTER 8

Creating, Buying, Selling, and Mining NFTs

Introduction

You now understand that a **Non-fungible token** (**NFT**) tokenizes a collectable item or work of art using blockchain technology. NFTs are openly owned digital ownership and validity certificates that can be easily verified on the blockchain.

NFTs are now very well-liked, thanks to the NBA, Mark Cuban, and Logan Paul. To launch your own NFT, you don't have to be a well-known YouTuber or a multibillionaire. Nifty Gateway, OpenSea, and Rarible are examples of recent startups that encourage engagement from all stakeholders. Collectors looking to get on the next wave of precious goods are looking for an NFT gold rush. After selling out in a matter of seconds and becoming live online some NFTs command high resale prices.

NFTs have changed how we view art, but this is just the beginning. The creation, production, and marketing of NFTs, as well as how to set up an account and fund it, will all be covered in this chapter.

In this chapter, we will talk about creating an NFT involves minting a unique digital asset on a blockchain, typically using Ethereum's ERC-721 or ERC-1155 standards. Buying and selling NFTs involves transactions on marketplaces like OpenSea, Rarible, or SuperRare, where buyers can purchase NFTs with cryptocurrency.

Mining NFTs is a process that involves contributing computational power to verify transactions on a blockchain, such as Ethereum, and being rewarded with newly minted NFTs as a result. This process is known as proof-of-work and requires specialized equipment and a significant amount of electricity. However, some newer blockchains, such as Tezos and Flow, use alternative consensus mechanisms that do not require mining.

Structure

In this chapter, we will cover the following topics:

- Creating and funding your account
- Creating NFTs

Objectives

After reading this chapter, you should be able to create and fund your account. You will also learn how to sell NFTs.

Creating and funding your account

NFTs have developed a well-known cultural phenomenon over the past year, frequently making news owing to celebrity involvement, antics, scams, and legal issues. Even while it is tough to tell whether they will continue to be popular or reclaim it after one or two market downturns, there are still plenty of reasons why someone might want to give it a try. Who can resist in a market where entrepreneurs have made millions of dollars?

Let us first go through the basics of what an NFT is and the decisions you might need to make before opting to sell NFTs. To create an NFT account, you can sign up for a wallet that supports the blockchain where you plan to mint your NFT, such as MetaMask for Ethereum. Once you have a wallet, you can fund it with cryptocurrency, which you'll need to pay for the transaction fees associated with minting your NFT.

To mint your NFT, you can use a platform or marketplace that supports the blockchain where you have your wallet. Some popular options for minting NFTs include OpenSea, Rarible, and Mintable.

Once you have minted your NFT, it will be associated with your wallet, and you can manage it from there, including transferring, selling, or displaying it on various platforms.

NFTs explained

NFTs are unique digital assets that are verified and stored on a blockchain. To create an NFT, you'll need to mint it on a blockchain using a specific standard, such as ERC-721 or ERC-1155 for Ethereum. To do this, you'll

need a wallet that supports the blockchain where you plan to mint your NFT, such as MetaMask for Ethereum.

Once you have a wallet, you can fund it with cryptocurrency, such as Ether for Ethereum, which you'll need to pay for the transaction fees associated with minting your NFT. The transaction fees cover the cost of verifying and adding your NFT to the blockchain, which requires a certain amount of computational power.

To mint your NFT, you can use a platform or marketplace that supports the blockchain where you have your wallets, such as OpenSea, Rarible, or Mintable. These platforms provide tools and templates to help you create your NFT, including adding images, videos, or other digital assets.

Once you have minted your NFT, it will be associated with your wallet, and you can manage it from there. You can transfer, sell, or display it on various platforms, such as NFT marketplaces or social media. The ownership and authenticity of your NFT are guaranteed by the blockchain, which provides a decentralized and transparent record of ownership.

NFT artwork is rarely stored on the blockchain

While **Non-Fungible Tokens** (**NFTs**) themselves are stored on the blockchain, the artwork or digital asset that the NFT represents is typically not stored directly on the blockchain. Instead, the artwork is usually stored on a decentralized or centralized server, with a link or reference to the artwork's location stored on the blockchain.

This is because storing large files directly on the blockchain can be impractical due to the limited storage capacity of most blockchains. Instead, the digital asset associated with an NFT is usually stored off-chain and referenced by the NFT's metadata, which is stored on the blockchain.

When someone purchases an NFT, they are essentially buying the ownership rights to the digital asset that the NFT represents, which is verified and secured by the blockchain. They can then access the digital asset by using the link or reference stored on the blockchain to view or download the artwork.

Selling an NFT

If your primary driving force behind creating an NFT is the naive notion that everyone else is doing it, there are a few things to consider. The first important one is the transaction price.

Most NFTs are exchanged on the Ethereum blockchain where fees are attached to each transaction, and these costs go to the miners. The quantity of *gas* required for a transaction (and hence the price of that transaction) might differ greatly. In a moment, we will talk about some of the processes for making NFTs without gas. Almost all transactions on the blockchain cost *gas*, including minting an NFT, delivering one to another user, and putting in a purchase offer.

It is also crucial to remember that paying for gas does not guarantee a successful transfer. Although you can pay more to boost your chances, nothing is ever certain. To be clear, most transactions have a respectable possibility of being profitable. But if something goes wrong and your transaction isn't finished, you won't get a refund for the gas you bought.

Climate debate involving NFTs

We will now discuss the effect of NFTs on the environment. The majority of the most popular NFT marketplaces are powered by the "proof of work" algorithm of the energy-intensive Ethereum blockchain. Even if it is questionable whether selling NFTs separately affects the blockchain's overall energy consumption; if your NFTs are constructed using Ethereum, you are utilizing a system with a sizable carbon footprint.

Some blockchains use less power-hungry mechanisms, and Ethereum has plans to change to a more efficient proof-of-stake mechanism in the future. However, since that has not occurred yet, some individuals might become incensed if others decide to sell NFTs.

Choosing a platform to sell your NFT

One book cannot possibly cover every platform that enables the sale of NFTs across all blockchains, let alone suggest the one that will be most beneficial for your project. However, we will concentrate on two of the most well-known marketplaces in this chapter:

- The AtomicHub in Solana
- The AtomicHub on the Wax blockchain

If neither of these appeals to you, there are still more options.

It is crucial to mention at this point that the chapter will teach you fundamental skills. Even with NFT markets, there are a lot of deep rabbit holes you can walk down that this chapter would not cover. Just keep in mind that this is not designed to be a comprehensive guide on selling NFTs, rather, it is merely meant to point you in the right direction.

OpenSea and Rarible's "lazy minting" technology allows you to create NFTs on Ethereum without paying anything. Lazy minting allows you to avoid paying any fees by producing an NFT and selling it without really writing it to the blockchain. When someone acquires your NFT, the fees for writing it to the blockchain and transferring it to the buyer will be merged. By doing this, you can prevent the situation where you mint an NFT for $10 to $30 (or more!) but no one purchases it.

Option of minting NFTs

Minting **Non-Fungible Tokens** (**NFTs**) involves creating a unique digital asset and verifying it on a blockchain. There are several options for minting NFTs, including:

- **Use a marketplace or platform**: There are several NFT marketplaces and platforms, such as OpenSea, Rarible, and SuperRare, that allow you to create and sell NFTs. These platforms provide tools and templates to help you create your NFT and guide you through the process of minting and selling it.
- **DIY using smart contracts**: If you have coding skills, you can create your own NFTs using smart contracts. Smart contracts are self-executing programs that run on a blockchain and allow you to create custom tokens, including NFTs. You'll need to be familiar with the blockchain where you plan to mint your NFT, such as Ethereum, and know how to write and deploy smart contracts.
- **Use a specialized NFT minting service**: There are also specialized NFT minting services, such as Mintbase and Mintable, that provide an easy way to create and mint NFTs without requiring extensive technical knowledge. These services typically charge a fee for their services, but they can be a convenient option for those who want to create NFTs quickly and easily.

Regardless of the option you choose, you'll need a wallet that supports the blockchain where you plan to mint your NFT, such as MetaMask for Ethereum. You'll also need to pay for the transaction fees associated with minting your NFT, which is typically paid in cryptocurrency.

Vox media's gaming-focused outlet - polygon

As you might have guessed, if there were no limitations or drawbacks, everyone would be utilizing these low or no-fee blockchains. You can currently sell single edition NFTs (one of one) using Flow on Rarible (auction sales are not currently supported). Additionally, when using non-Ethereum blockchains like Flow or Polygon, users cannot utilize Ethereum to purchase their NFTs (at least, not without going through extra, fee-inducing steps). Although both platforms permit users to add funds to their wallets to complete a transaction, some collectors may be put off by the requirement that they exchange their NFT for another cryptocurrency or purchase it outright.

Note: Polygon does permit the use of Ethereum, but only in the context of its specific implementation. But doing so will cost you money in gas. Ethereum can be moved from the main blockchain to Polygon right away and vice versa.

Using a marketplace

Your smart contract can be developed, installed on the blockchain of your choice, and then used to issue your currency. You generally do not want to take that chance and jump in headlong unless you are extremely technical. One of the platforms will be preferred by most consumers.

Setting up a wallet

A wallet is a piece of software that you use to store your cryptocurrencies as well as any NFTs you end up buying or minting. The primary concern when starting is utilizing a wallet that is compatible with the blockchain you are using. A more thorough explanation of wallet functionality and possible choices may be found on Coinbase.

MetaMask is one wallet that receives a lot of support from Ethereum-based

applications like OpenSea, Foundation, and others. It can be used as a Chrome or Firefox plugin, an iOS or Android app, or both. Most platforms provide access to Coinbase's wallet, which you may use via an extension or app. Since it supports blockchains other than Ethereum-based ones like Bitcoin, you might want to consider utilizing Coinbase's wallet if you want to invest in cryptocurrencies more extensively.

Both MetaMask and Coinbase Wallet can be set up in the same way. Once you have downloaded the mobile app or installed the browser extension, click on the **Create new wallet** button (you can get MetaMask here and Coinbase Wallet here). Make sure your login ID and password are both safe because Coinbase will ask for both (preferably by generating it with and saving it in a password manager). Let's take a look at *Figure 8.1* to understand the **MetaMask Secret Recovery Phrase**:

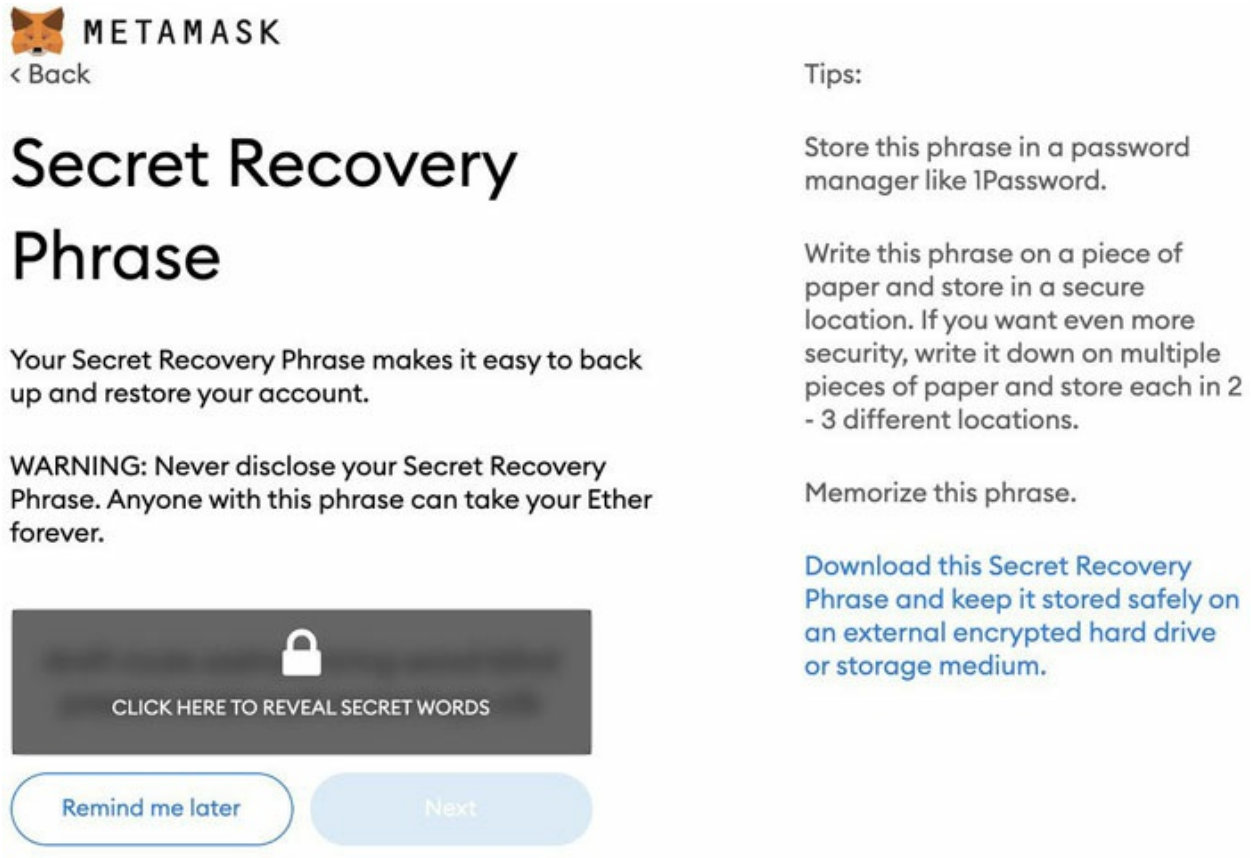
METAMASK
< Back
Secret Recovery Phrase
Your Secret Recovery Phrase makes it easy to back up and restore your account.
WARNING: Never disclose your Secret Recovery Phrase. Anyone with this phrase can take your Ether forever.
CLICK HERE TO REVEAL SECRET WORDS
Remind me later
Next
Tips:
Store this phrase in a password manager like 1Password.
Write this phrase on a piece of paper and store in a secure location. If you want even more security, write it down on multiple pieces of paper and store each in 2 - 3 different locations.
Memorize this phrase.
Download this Secret Recovery Phrase and keep it stored safely on an external encrypted hard drive or storage medium.

Figure 8.1: *MetaMask secret recovery phrase*

Finally, both MetaMask and Coinbase will give you a "seed phrase," which comprises 12 random words. If you need to, for example, delete the app or set up your wallet on a different device, having this safe will allow you to restore

access to your account. Make a copy of it and store it somewhere extremely secure, such as a physical safe or password manager (or both). If you set it up using the app, Coinbase Wallet will ask you if you want to save an encrypted version of the phrase in the cloud, but MetaMask will need you to say the phrase out.

If you are setting up Coinbase with the extension or if you choose to manually backup the data rather than save it to the cloud, it will be the same setup procedure as MetaMask, where you will manually input the phrase again.

If you forget your security phrase or password, you are out of luck with both MetaMask and Coinbase Wallet, neither service can help. This means that any cryptocurrencies or NFTs stored in that wallet, as well as any accounts you may have made with it, will no longer be accessible to you. Please keep your password and secret phrase private.

Your wallet will now be accessible to you; however, nothing will be inside just yet.

Connecting your wallet

You must connect your wallet to the NFT marketplace you wish to utilize after setting it up. **`OpenSea`** and Rarible make this simple.

1. Click on the **`Create`** button to link your wallet.
2. When you choose your **`wallet`** from the list of compatible wallets that appears, you will be prompted to finish the connection process.
3. *Figure 8.2* shows how to **`Connect with MetaMask`**. Connecting an account to MetaMask is straightforward thanks to the browser extension:

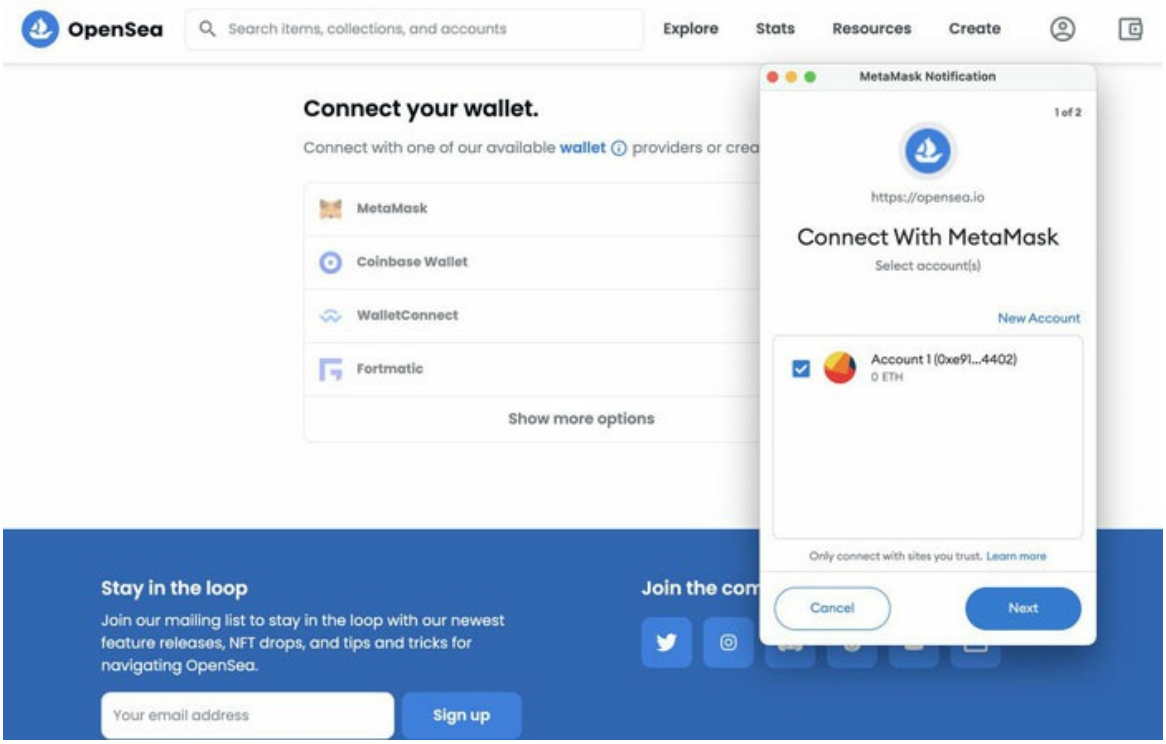

Figure 8.2: *Connect with MetaMask*

4. You will get a pop-up asking whether you want to **`Connect your wallet`**. You can do this with a few mouse clicks regardless of whether you have MetaMask or Coinbase's extension installed. To access the market, if you're using the Coinbase Wallet app, you can also scan a QR code (which you can find to the right of your balance on the main wallet screen).

You can connect to NFT markets or other apps that need a wallet by scanning a QR code using the QR button in the Coinbase Wallet app.

A word of warning: In the future, be wary if you unexpectedly notice a request to connect to your wallet since thieves may be trying to access your cash or NFTs. If you are on a reliable website, everything should be fine (at least, assuming there are no major issues, always double-check your transactions to make sure they are legal). However, you should frequently think twice before allowing access to a website if it asks for access to your wallet and you are unfamiliar with it.

Creating an NFT

After you have connected your wallet, a page where you can create an NFT

will emerge, if you do not land there, you can get there by clicking on the **`Create`** button positioned in the top right-hand corner.

Before we begin creating our NFTs, let us talk about collections. Collections are exactly what they sound like and are present on both platforms. If you want to create multiple NFTs on Rarible, you can create a collection right from the NFT creation screen, to which the NFT you are generating will be added. To begin, you must click on your profile picture in OpenSea's upper right corner, then choose **`My Collections`** | **`Create a collection`**.

In this chapter, we would not go into detail about collections, but OpenSea will automatically place any NFTs you create into an unnamed collection if you don't specify one (you can edit the collection later or move the NFT to another collection), and Rarible allows you to sell an NFT as a Rarible Single without a collection.

Let's now start constructing our NFT.

Listing an NFT on OpenSea

Follow the given steps to list an NFT on OpenSea:

1. After hitting the Create button, you will be taken to the create new item page.
2. Click on the box with the image icon on it to start the process of uploading the file you will be selling as an NFT (though, do make sure to take note of the file size and type limitations noted above the selector).
3. After you have added your file, give it a name or title. Additionally, you may put a link to your website or Twitter account in the External Link box, and you can correctly describe your NFT to potential clients in the Description part. *Figure 8.3* describes how to create a new item:

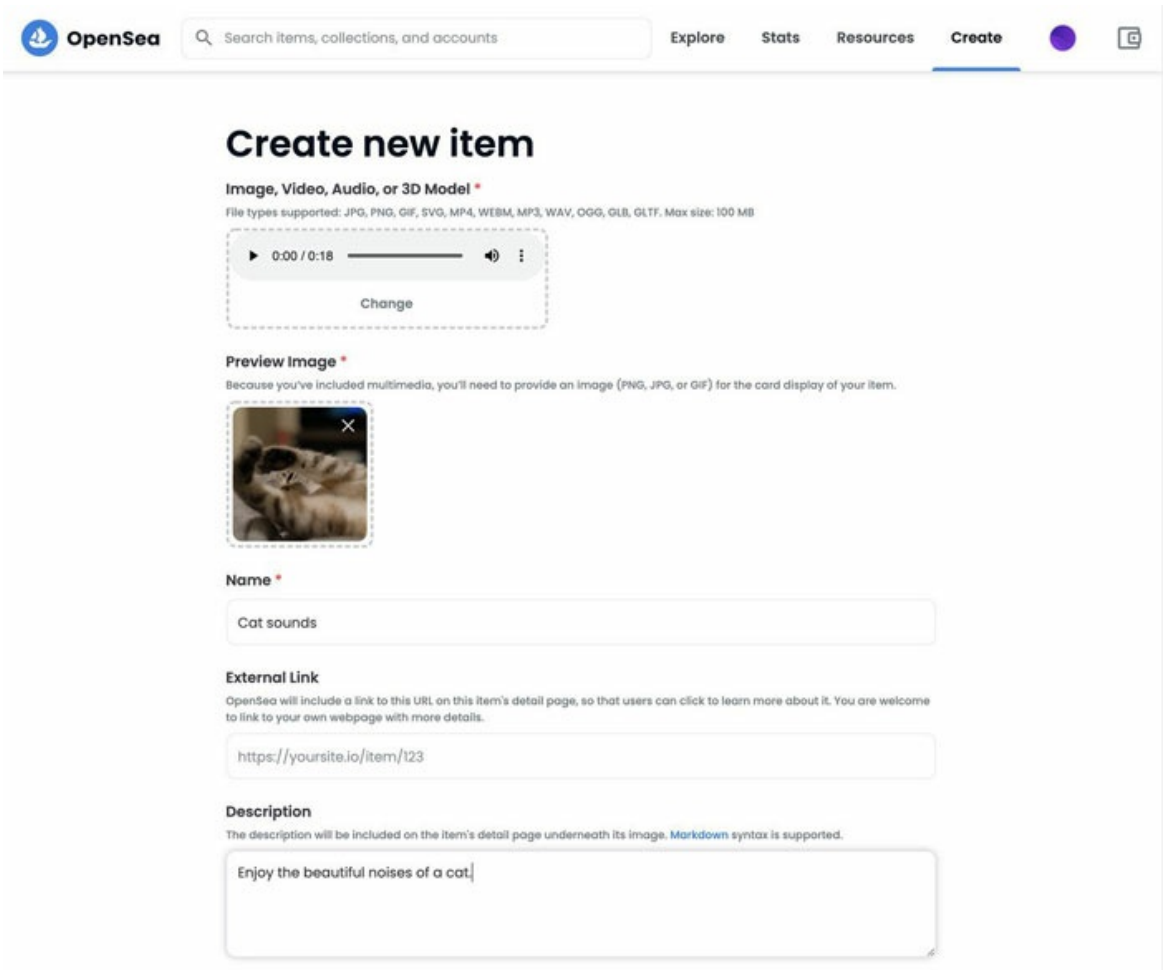
OpenSea
Search items, collections, and accounts
Explore
Stats
Resources
Create
Create new item
Image, Video, Audio, or 3D Model *
File types supported: JPG, PNG, GIF, SVG, MP4, WEBM, MP3, WAV, OGG, GLB, GLTF. Max size: 100 MB
0:00 / 0:18
Change
Preview Image *
Because you've included multimedia, you'll need to provide an image (PNG, JPG, or GIF) for the card display of your item.
Name *
Cat sounds
External Link
OpenSea will include a link to this URL on this item's detail page, so that users can click to learn more about it. You are welcome to link to your own webpage with more details.
https://yoursite.io/item/123
Description
The description will be included on the item's detail page underneath its image. Markdown syntax is supported.
Enjoy the beautiful noises of a cat.

Figure 8.3: *Creating a new item*

4. Several file formats require a supplementary "preview" image, such as music or video.
5. If you have built a collection for your NFT, you can select it from those fields. You can also add statistics, levels, or attributes that can serve as information. Here, you can provide the data for an NFT that, for instance, can act like a character in a video game. Use the properties tab to add details about a work of art you are selling, such as the medium, year, and so on. However, since each of these fields is optional, many users will likely be able to ignore them.
6. Additionally, OpenSea gives you the option to insert text that will serve as unlocking material and be seen by the buyer or owner of the NFT. You can add things to this toggle-able area such as a thank-you note for their purchase, a link to a private *Discord*, or a discount to use on any external website. You can also use the explicit and sensitive material

toggle if your NFT is NSFW in nature. *Figure 8.4* describes the option to mint multiple copies of NFT:

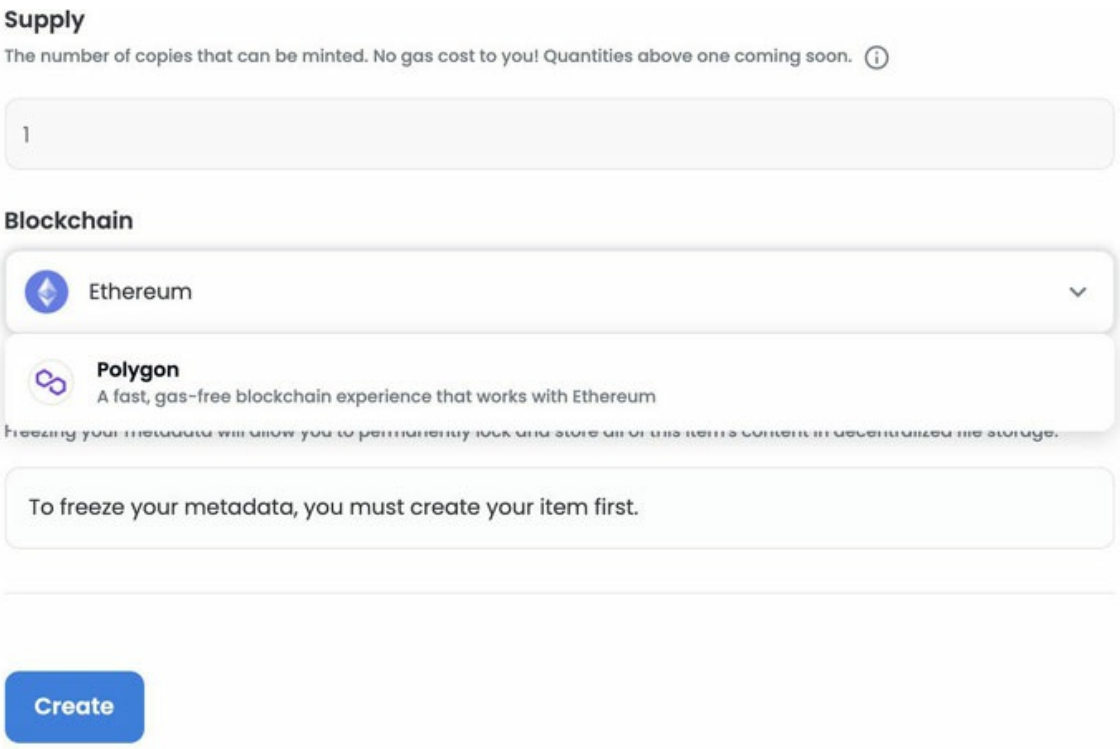
Supply
The number of copies that can be minted. No gas cost to you! Quantities above one coming soon.
1
Blockchain
Ethereum
Polygon
A fast, gas-free blockchain experience that works with Ethereum
To freeze your metadata, you must create your item first.
Create

Figure 8.4: *Minting multiple copies of NFT*

7. The blockchain you select for your minting must be carefully considered because you cannot alter it afterwards and it could significantly affect the fees you pay.
8. Following those toggles and fields is a drop-down menu with options for the Polygon and Ethereum chains to mint your NFT. Let us choose Polygon because there are no fees associated with it for now. You will also have the option to make extra NFTs if you decide to use Polygon for your minting.
9. After this, you should double check everything. If you have not placed it up for sale, OpenSea allows you to edit the metadata later, but it is best to check whether everything is in order before engaging in any blockchain-related activity. Also, take note that after the NFT has been created, you won't be able to modify the blockchain.
10. Click on the **`Create`** button once you are ready to go. *Figure 8.5* shows that your NFT has been created after it is finished:

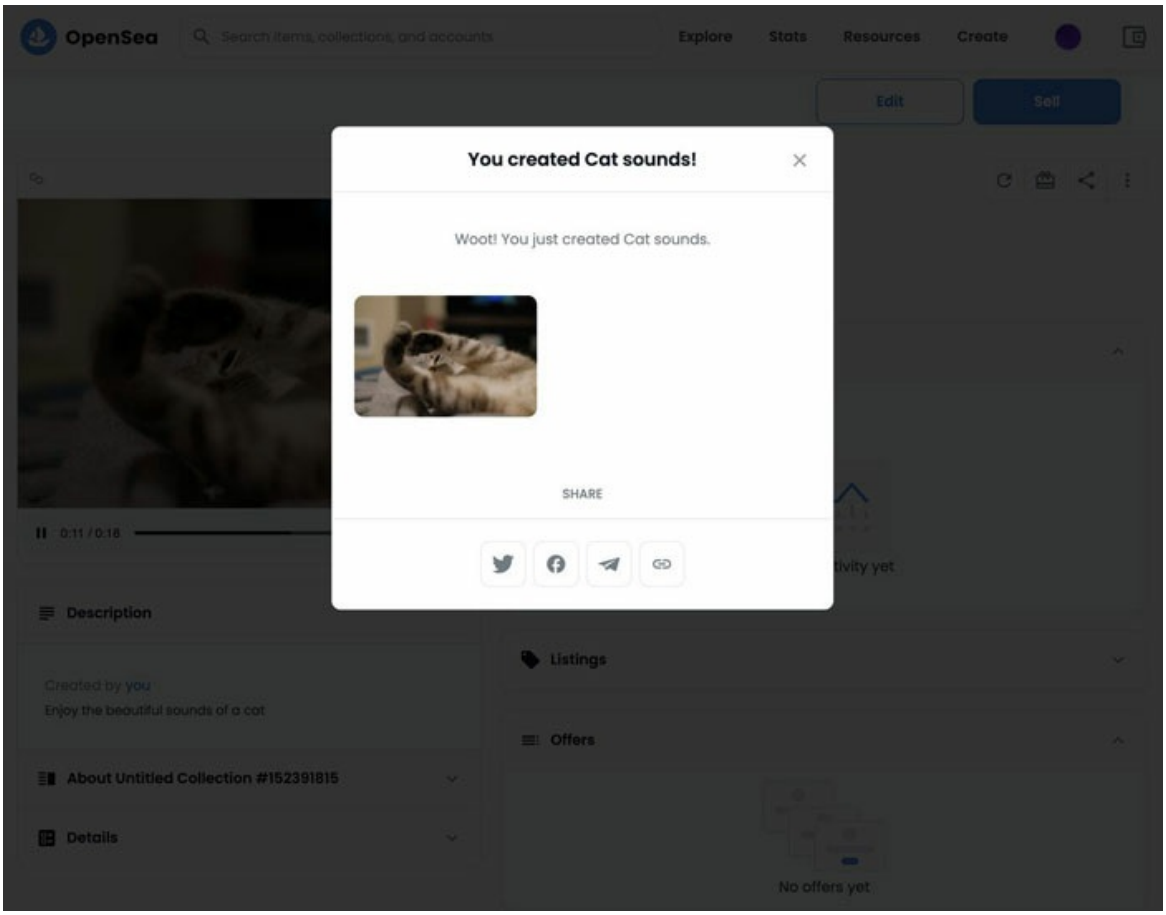

Figure 8.5: *NFT is created successfully*

11. Our NFT is currently available for purchase and is advertised on OpenSea, but it has not yet been uploaded to the blockchain.
12. But you must exit the congratulations screen and go to your NFT's website to list your NFT for sale on OpenSea (you can also get to it by clicking on your profile picture, clicking on the Created tab, and selecting the NFT). The Sell button will be included on the NFT page. *Figure 8.6* shows the screen to sell the NFT:

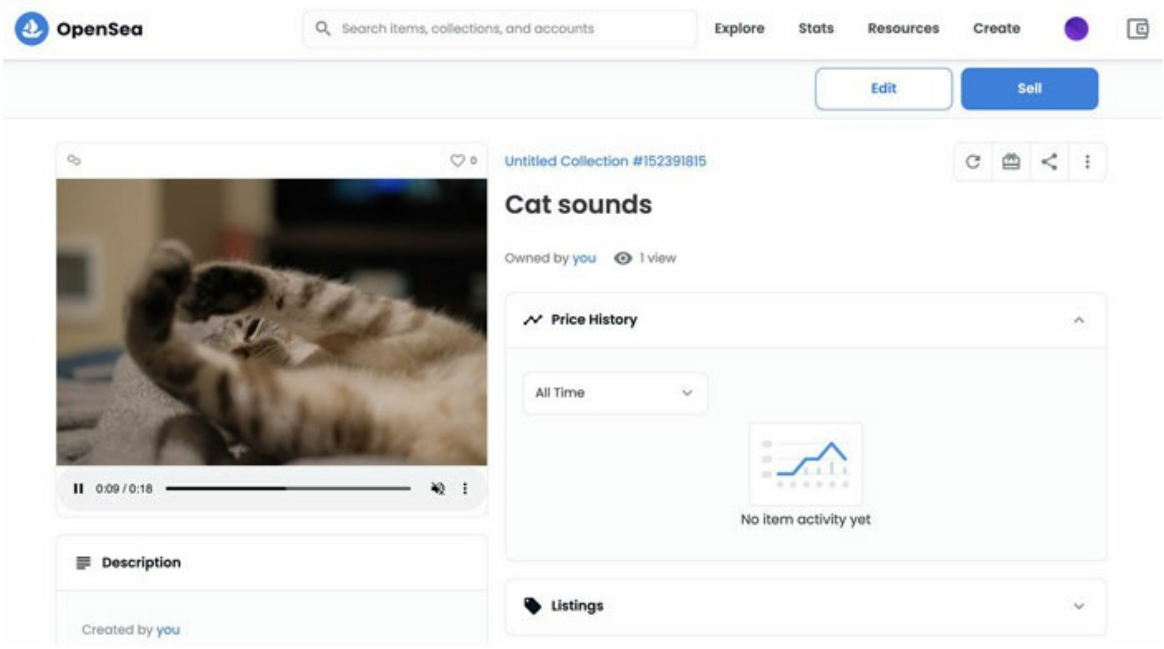

Figure 8.6: *Selling NFT*

13. Even if this NFT has been made and is not currently available for purchase, you can list it by clicking on the **`Sell`** button.
14. Using NFTs advertised on Polygon or Ethereum, you can decide to create a listing for a set price. On Ethereum, you can also decide to hold a timed auction. For a fixed-price listing, all you need to do is enter the item's price in Ethereum and choose how long you want the ad to stay up. It will then provide a rough conversion to dollars as shown in *Figure 8.7*. Only fixed-price sales were accepted by OpenSea's Polygon implementation as of the time of writing. Let’s take a look at *Figure 8.7*:

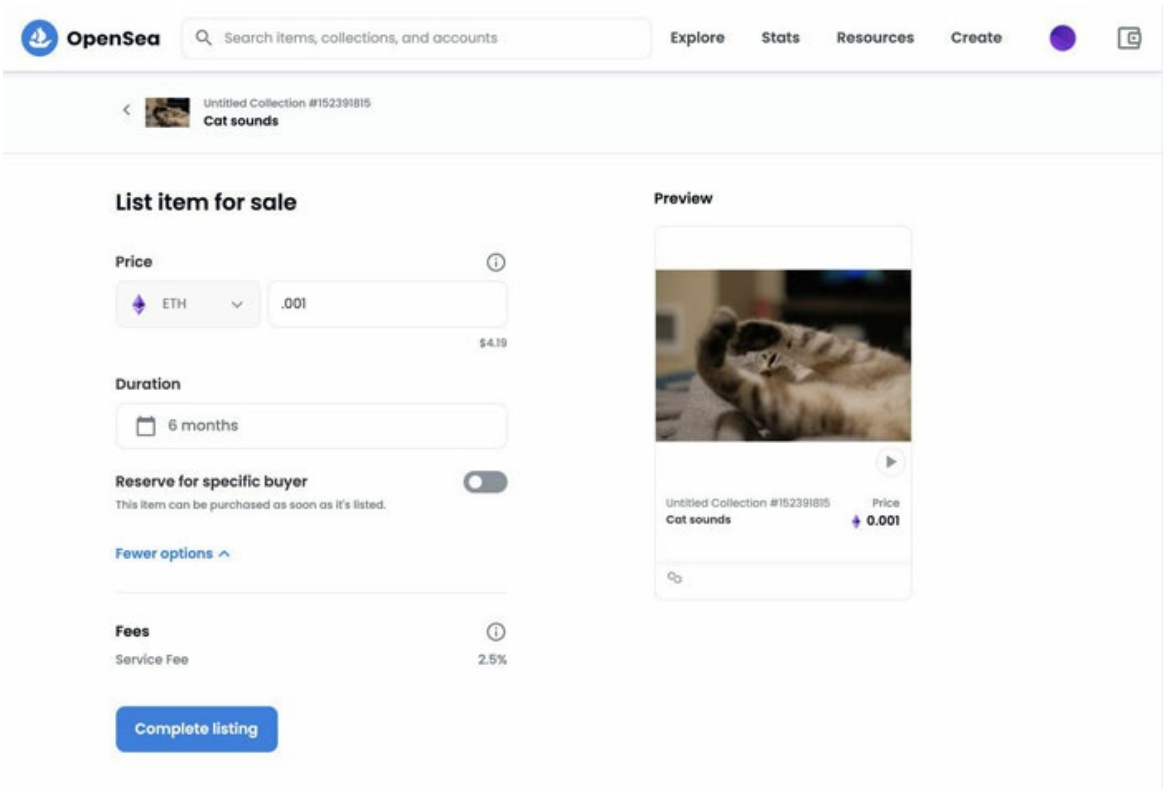

Figure 8.7: *Listing an NFT to sell*

You can restrict who can purchase the NFT using the **`More options`** dropdown as it will be made available for purchase as soon as it is advertised.

15. Only choose **`Complete listing`** from the drop-down menu to list your NFT for sale. A few transactions require the app or browser extension installed on your device to authorize them. You will be notified via a screen that your item has been featured on the Polygon free marketplace.
16. The Coinbase Wallet app's **`Signature Request`** is depicted in *Figure 8.8*:

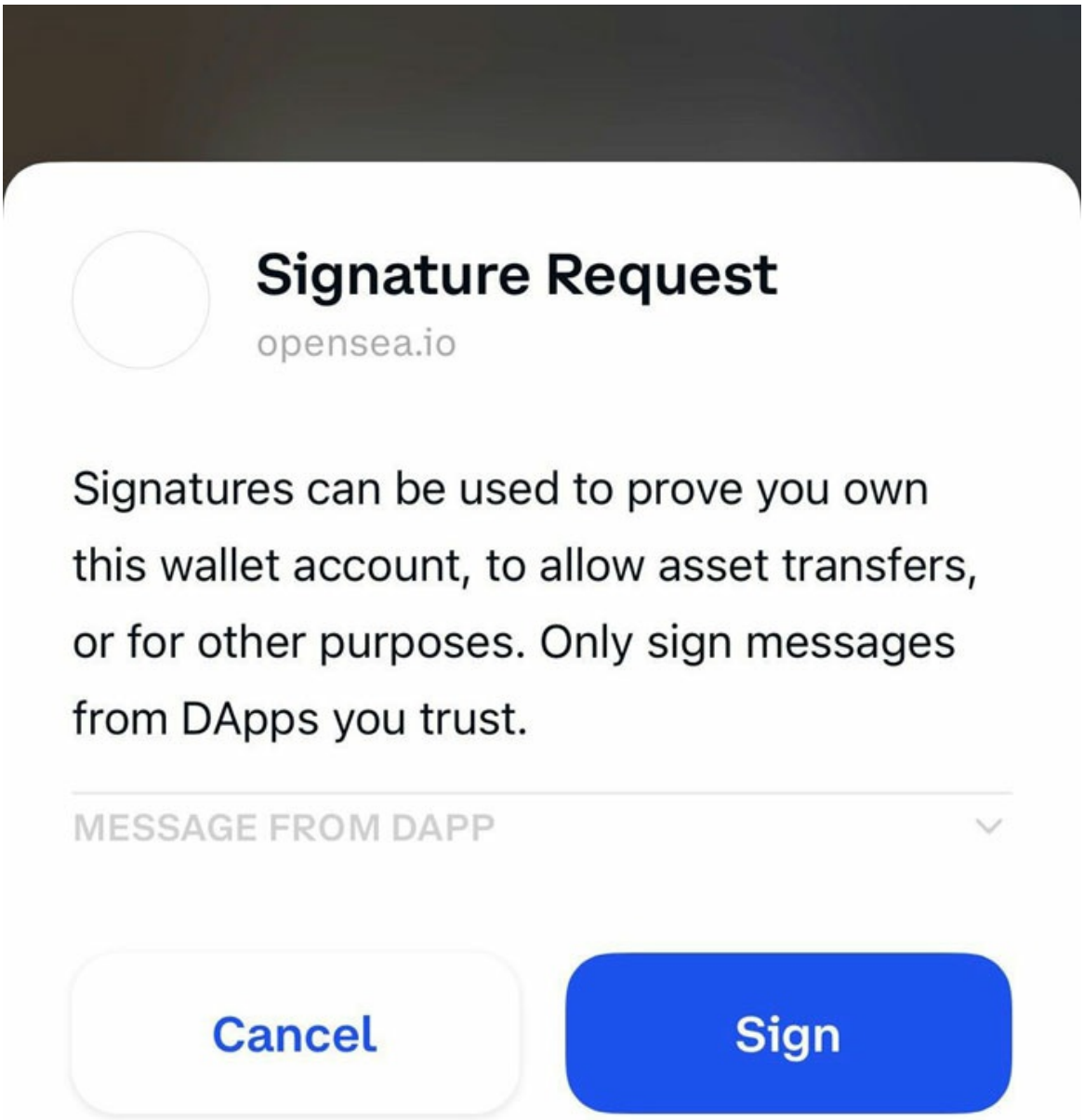
Signature Request
opensea.io
Signatures can be used to prove you own this wallet account, to allow asset transfers, or for other purposes. Only sign messages from DApps you trust.
MESSAGE FROM DAPP
Cancel
Sign

Figure 8.8: *The Coinbase Wallet app's signature request*

17. You will need to do a one-time approval transaction to "initialize" your Ethereum wallet if it is your first NFT, as mentioned earlier. To do this, you must have Ethereum in your wallet. Although purchasing cryptocurrencies could be the focus of a different discussion, this is a good place to start.
18. Because this transaction only pays for gas and does not include any fees for OpenSea, its cost entirely depends on the current cost of Ethereum's gas fees. Initial testing in December 2021 showed prices from

approximately $240 to $450, but by June 2022, they had dropped to between $50 and $60. You might wish to wait till the price drops if the fees seem high because they are heavily influenced by the price of Ethereum and the number of transactions that are attempted. Use a website like ETH Gas Station or keep an eye out for a high charge notice in MetaMask to keep track of transaction fees. *Figure 8.9* shows Registering to use Ethereum with OpenSea. Signing up to use Ethereum with OpenSea can be expensive:/p>

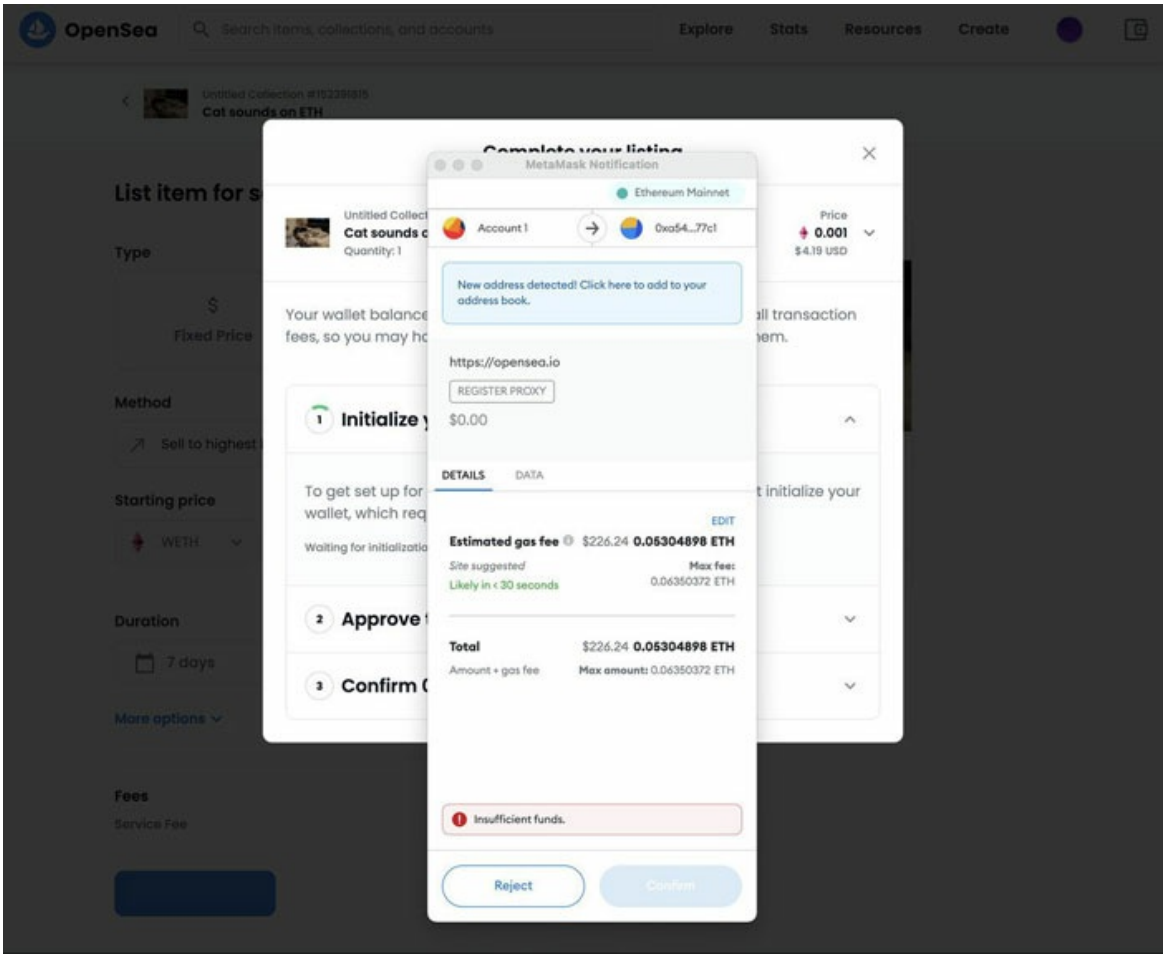

Figure 8.9: *Registering to use Ethereum with OpenSea*

19. Once you have seen and approved all the transactions, your NFT will be made available for sale on OpenSea.

Listing an NFT on Rarible

To list an NFT (Non-Fungible Token) on Rarible, follow these steps:

1. Sign up for an account on Rarible.com and connect your wallet. Rarible supports several wallets, including MetaMask, WalletConnect, and Bitski.
2. Click on the `Create` button on the top right-hand corner of the screen and select `Item` from the drop-down menu.
3. Fill out the item creation form, which includes information about your NFT, such as its name, description, and image or video. You can also set a price for your NFT and choose whether to make it an auction or a fixed-price sale.
4. Once you've filled out the form, click on the `Create` button at the bottom of the page.
5. If you're making a fixed-price sale, you'll need to pay a one-time minting fee to create your NFT. If you're making an auction, you'll need to set a starting bid and a reserve price, which is the minimum price you're willing to sell your NFT for.
6. After you've paid the minting fee or set your auction terms, your NFT will be listed on the Rarible marketplace, and you can share the link to your listing on social media or other platforms to promote it.
7. If someone purchases your NFT, the transaction will be processed on the blockchain, and the ownership of the NFT will be transferred to the buyer.

Remember that listing an NFT on Rarible or any other marketplace does not guarantee that it will sell, and you'll need to put in the effort to market and promote your NFT to potential buyers.

Using your NFT

Once you own a **Non-Fungible Token** (**NFT**), there are several things you can do with it depending on the type of NFT and its associated digital asset. Here are some examples:

- **Display it**: If your NFT represents a digital artwork, you can display it on your computer, phone, or another compatible device. Some NFT marketplaces, such as OpenSea and SuperRare, also have galleries where you can display your NFTs.
- **Sell it**: You can sell your NFT on an NFT marketplace or through a

peer-to-peer transaction. The value of an NFT can fluctuate based on supply and demand, so the price you can sell it for may vary.

- **Trade it**: You can trade your NFT for other NFTs or cryptocurrencies. Some NFT marketplaces, such as Nifty Gateway, offer trading features that allow you to exchange NFTs with other users.
- **Hold it**: You can hold onto your NFT as a long-term investment. Some NFTs may increase in value over time, especially if they are associated with a popular artist or digital asset.
- **Access exclusive content or experiences**: Some NFTs may give you access to exclusive content or experiences, such as backstage passes, meet-and-greets, or other perks.

It is important to keep in mind that the specific uses of an NFT depend on the terms and conditions set by the issuer or creator of the NFT.

Conclusion

In conclusion, NFTs (Non-Fungible Tokens) are unique digital assets that are verified on a blockchain. They have become increasingly popular in recent years, particularly in the art and collectibles space, and can be created, bought, sold, and even mined.

Creating NFTs involves minting a unique digital asset and verifying it on a blockchain, which can be done using a marketplace or platform, smart contracts, or specialized minting services. Buying and selling NFTs can be done through NFT marketplaces or through peer-to-peer transactions, and NFTs can be traded for other NFTs or cryptocurrencies.

Mining NFTs involves using computational power to solve complex mathematical problems and receive rewards in the form of newly minted NFTs. However, mining NFTs is typically only profitable for those who have access to specialized hardware and software.

NFTs have a wide range of uses, including displaying digital artwork, trading and holding for investment, and accessing exclusive content and experiences. It's important to understand the specific terms and conditions associated with an NFT before creating, buying, or using it.

Key terms

- **Minting:** The process of creating a new NFT and verifying it on a blockchain.
- **Smart contract:** A self-executing contract that automatically enforces the terms of an agreement between two parties.
- **Gas fees:** Fees paid in cryptocurrency to process transactions on a blockchain network.

Multiple choice questions

1. **What is the process of creating a new NFT called?**
    a. Mining
    b. Trading
    c. Minting
    d. Selling
2. **How are NFTs typically bought and sold?**
    a. Through peer-to-peer transactions
    b. Through cryptocurrency exchanges
    c. On NFT marketplaces
    d. All of the above
3. **What is the process of using computational power to solve complex mathematical problems and receive rewards in the form of newly minted NFTs called?**
    a. Selling
    b. Trading
    c. Mining
    d. Creating
4. **What is a digital wallet?**
    a. A type of smart contract.
    b. A set of rules and guidelines that govern the creation and use of digital tokens.

c. Software that allows users to store, send and receive digital assets, including NFTs.
d. An algorithm used to verify transactions on a blockchain network.

5. **What are gas fees?**

a. Fees paid in cryptocurrency to process transactions on a blockchain network.
b. A type of smart contract.
c. A set of rules and guidelines that govern the creation and use of digital tokens.
d. An algorithm used to verify transactions on a blockchain network.

Answers

1. **c**
2. **c**
3. **c**
4. **c**
5. **a**

Join our book's Discord space

Join the book's Discord Workspace for Latest updates, Offers, Tech happenings around the world, New Release and Sessions with the Authors:

https://discord.bpbonline.com

CHAPTER 9

Legal Aspects and Future of NFTs

Introduction

NFTs, or non-fungible tokens, are a class of digital assets signifying ownership of a special good or a piece of content, like digital collectibles or a work of art. The issue of ownership and whether an NFT constitutes a legally recognized form of property are the most crucial legal elements of NFTs.

In most jurisdictions, having a title or deed that is in good standing with the law establishes ownership of the real estate. The ownership of a digital token that is kept on a blockchain, a decentralized digital ledger, establishes ownership with NFTs, though this begs the question of whether NFTs are regarded as a type of property that can be purchased, sold, and owned in the same manner as other types of property under the law.

NFTs' legal classification as securities is a different legal concern. Certain digital asset classes, like cryptocurrencies, are regarded as securities in several nations, including the US, and are therefore governed by securities laws. Depending on their unique traits, such as the rights and liabilities attached to the token and the anticipation of profit from token acquisition, NFTs may or may not be regarded as securities.

The issue of NFTs' copyright and other intellectual property components must also be addressed.

Governments, regulators, and other stakeholders are becoming more interested in comprehending and regulating NFTs as they grow in popularity. Many nations have already begun developing NFT rules or are at least exploring the options.

NFTs can have a significant impact on the art and collectibles market in the future by making it easier for creators to monetize their work and for collectors to acquire and trade one-of-a-kind works of digital art.

But before NFTs can realize their full potential, a lot of legal and practical issues must be resolved because the regulatory environment is still in the

early stages of development. In terms of the legal and technological landscape, NFTs represent an intriguing and quickly developing field. It will be interesting to watch how they are utilized and controlled in the years to follow. In this chapter, we will study the legal aspects and the future of NFTs.

Structure

In this chapter, we will cover the following topics:

- NFTs securities
- Intellectual Property Rights
- Right of Publicity
- Right of Privacy
- Contracts
- Taxes
- Understanding the anatomy of NFT
- Property rights of NFTs
- Metaverse
- Non-bankable assets
- Digital wallets

Objectives

After studying this chapter, you should be able to know the ins and outs of NFTS securities, and understanding the NFTs and Digital Property, NFTs and Real Property, Metaverse, Non-Bankable Assets, and Digital Wallets.

NFTs securities

The designation of any digital asset, including **Non-fungible tokens** (**NFTs**), as a *"security"* is up to securities regulators. The question of whether a potential buyer would be subject to securities laws just by buying and selling NFTs is raised by this.

Thanks to the industry's expansion into the metaverse, digital assets can now be linked to and incorporated into brand-new virtual worlds, raising the potential of them ultimately being utilized for commerce and might be

subject to these securities regulations.

What are the views of different countries regarding NFTs' transactions and their labeling as "registered" securities?

Given the ongoing education NFTs are currently providing to the fintech and legal landscapes, the answer as to where regulators across the world officially stand is not entirely obvious yet. Still, several, including the U.S., U.K., Hong Kong, and China, are already looking at the issue.

Regulators around the world have not yet fully decided the key legal issue of whether NFTs are regarded as securities. Different authorities and market participants have come to different conclusions on whether specific forms of NFTs should be regarded as securities.

The **Securities and Exchange Commission** (**SEC**) in the United States has taken the stance that some digital assets, including NFTs, may be regarded as securities and as a result be governed by securities rules and regulations. The Howey Test is used to determine if an NFT qualifies for security. It looks at whether investing money in a group project with the hope of making money primarily from the labor of others qualifies as an investment contract and, therefore, security.

NFTs would be governed by securities laws, including registration, disclosure, and other obligations if they were to be regarded as securities. This might affect how NFTs are issued, sold, and traded, as well as affect how much it costs market players to comply with regulations.

However, since they don't reflect an investment in a common business with the prospect of profit, some NFTs might not be regarded as securities. They might not be regarded as investments but rather as some sort of ownership over something special that isn't intended to yield a profit, like digital art.

The precise characteristics of NFTs, such as the rights and duties attached to the token and the expectation of profit from the token's purchase, will therefore determine whether they are to be regarded as securities. Both creators and consumers should be aware of how the legal system in their respective countries is changing and evolving.

United States and NFT securities

Keep in mind that the United States abides by the landmark 1946 Howey

decision of the U.S. Supreme Court, which establishes four factors that decide whether a cryptocurrency or digital asset like an NFT is viewed as *a security* or *investment contract:*

- Financial investment
- Involvement in a joint venture
- Existence of a profit expectation
- Receipt of earnings from the efforts of third parties

Each state has its own securities law, which may have requirements that are different from or in addition to those of the ruling federal law. While the U.S. SEC and **Commodity Futures Trading Commission** (**CFTC**) are primarily responsible for overseeing the federal law's regulation of digital assets, each state also has its own securities laws.

In April, Texas and Alabama securities regulators issued cease and desist orders to the virtual casino operator Sand Vegas Casino Club, domiciled in Cyprus, purportedly for selling NFTs against the law.

Ownership of an NFT would bring various perks, including a share of any earnings generated by the casinos, according to advertising from Sand Vegas to the buyers. By and through its Gambler Ape NFTs, Sand Vegas developed a virtual gambling character.

According to Sand Vegas, the money it received from the sale of NFTs would be utilized to create virtual casinos around the metaverse. However, when the online casino developer tried to offer their NFTs to customers and possible investors, regulators in both jurisdictions found several *forgotten* procedures that the company had overlooked.

Using a logo that is extremely like an established trademark belonging to another Las Vegas-based gaming company, which increases the likelihood of consumer confusion; failing to disclose that Sand Vegas' principals would be entitled to a 10% royalty on sales; also failing to disclose all of Sand Vegas' business partners and officers, as well as their backgrounds alongside qualifications for due diligence.

United Kingdom and NFTs

The High Court of Justice in the United Kingdom determined that NFTs are

considered "private property" in that country, marking an important legal victory for the British Web3 community in May 2022.

The theft in February 2022 of two NFTs from the renowned Boss Beauties project, a global movement headed by women that foster possibilities for girls and women through cutting-edge partnerships was the catalyst for the Court's ruling.

Lavinia Osbourne, the founder of Women in Blockchain Talks, said that two Boss Beauties NFTs were stolen from her online wallet in March 2022.

To provide the required protections for the underlying work of the original authors, the High Court issued a warning that this *private property" status "* does not apply to the real underlying content that the NFT represents.

Although this represented a significant advancement in the treatment of NFTs in the United Kingdom, the main lesson is that UK courts have the authority to order asset-freezing injunctions against specific accounts on NFT marketplaces like Ozone Networks and OpenSea when it is claimed that NFTs have been stolen.

There is no comprehensive "big picture" view on how the U.S. and the U.K. views on original works of authorship under copyright law differ as the U.K. and the U.S. rule with the same copyright laws.

Hong Kong

As part of the region's **Anti-money laundering** (**AML**) regulations, MPs in Hong Kong tabled new legislation on Sunday, June 10. This legislation aims to establish a new licensing scheme for crypto service providers.

A license from the Hong Kong **Securities and Futures Commission** (**SFC**) will be necessary for organizations working with cryptocurrency projects that wish to operate a trading platform, among other requirements, according to the proposed legislation.

The SFC released its initial set of recommendations on how investors should approach the acquisition and sale of NFTs in June, highlighting the elevated risks these instruments carry due to volatile secondary markets, illiquidity, opaque pricing, hacking, and fraud.

According to the news release, if an NFT is a **Collective investment scheme** (**CIS**) or a fractionalized token, Hong Kong-based NFT issuers or those who

are trying to attract investors must apply for a license with the SFC.

It also defines a "CIS," delineating its four components as "projects that enable participants to receive profits, income, or other rewards," and makes it clear that NFTs that do not fit into those categories won't be subject to regulation.

China

China clarified its position on NFTs in April 2022, releasing a set of guidelines for how the China Internet Financial Association, the China Banking Association, and the China Securities Association will handle NFT projects.

The instructions clearly say that:

- Bonds, insurance, securities, precious metals, or other financial assets shall not be the underlying assets of NFTs.
- Platforms shouldn't give NFTs access to centralized exchanges.
- Cryptocurrencies should not be used to transact NFTs.
- To prevent money laundering, platforms should require real-name identity verification and keep track of consumer transactions.
- No organizations shall directly or indirectly finance NFT investments.

Despite its strict regulation of cryptocurrencies, China has acknowledged the value NFTs offer to the market by separating excitement and the possibility of fraud from genuine value added.

Intellectual Property Rights

In the world of non-fungible tokens, **Intellectual property rights** (**IPR)** are quite important NFTs.

NFTs, or non-replicable digital assets, are frequently used to signify ownership of a digital piece of art or other creative content.

The copyright to the underlying creative work or other content is owned by the person who created the NFT. However, they normally do not sell the copyright to the underlying work when they sell an NFT; instead, they simply offer the right to own and display the NFT. This means that without the

owner's consent, the purchaser of an NFT cannot distribute or reproduce the underlying work.

The IPR for the actual thing would also be considered if NFTs were to be used to represent ownership of tangible objects like collectible trading cards or other memorabilia.

Despite this, several platforms or NFT makers are looking for ways to expand usage rights and develop new kinds of NFTs, such as:

- NFTs with smart contracts inside: These would allow utilization of the underlying work in particular ways or methods that can be set by the creator.
- Royalties paying: These would provide the creator with a portion of every resale of the NFT.

The environment for NFTs and IPRs is still changing, and as the technology is used more extensively, it is conceivable that new applications and legal frameworks may appear.

NFTs might be covered by intellectual property rights such as copyright, design patents, and trademark protections. As a result, buyers of NFTs should be aware of any associated intellectual property rights. In fact, the license that comes with many or even most NFTs merely allows the NFT buyer to use, copy, and display the NFT.

For instance, Jack Dorsey earned around $3 million from selling an NFT of his very first tweet. Because Dorsey continues to hold the copyright, the owner of the NFT did not acquire any intellectual property rights in the tweet itself and was therefore unable to, for example, print the tweet on hats and sell them without Dorsey's consent.

However, while the majority of NFT producers place limitations on commercial use, other authors grant NFT owners broader rights. Members of the **Bored Ape Yacht Club** (**BAYC**) have the right to use their "apes" for commercial purposes, which allows them to produce and market hats, T-shirts, mugs, and other items. Similarly, owners of Crypto Kitties are granted a wide range of rights under the conditions of the license and are allowed to market their own products if they don't generate more than $100,000 a year in sales.

In terms of copyright, once the NFT is established, copyright protection is

present in the US. The ownership of the copyright does not necessarily transfer with the sales of the NFT. This subtlety signifies that, without a copyright assignment to the NFT, the owner normally retains ownership of the copyright. Regardless of who owns the NFT of the original work, all income that may later result from the work will belong to the person who has the copyright on the underlying work.

The minting procedure for NFTs allows the addition of a royalty rate, with associated details added to the smart contract. Additionally, NFT royalties might pay inventors a fee each time an NFT is sold. With this choice, artists now have a new possibility to profit from leftover intellectual property rights after the initial sale.

Brand owners ought to think about expanding the scope of their trademark registrations to include NFTs. As an illustration, the footwear and apparel company Nike has applied for trademarks to make and virtually sell Nike-branded shoes and clothing. In December 2021, Walmart also submitted several trademark applications pertaining to the production and marketing of virtual goods.

Brand owners should consider how current or upcoming design patents can protect against imitations or infringement in addition to trademark and copyright protection. Because they grant owners full ownership of an infringer's profits rather than just the fraction related to the use of the design, design patents are essential intellectual property protections in comparison to other IP rights.

Possibility of forging NFTs

Even though an NFT cannot be copied, others may try to manufacture new NFTs for replicas of the original asset to confuse consumers and make money from the original brand. Take the Hermes Birkin bag, which is renowned throughout the world for its luxury and style. An NFT constructed using a replica of the bag has been produced and marketed without giving credit to the Hermes name.

In a recent lawsuit, Hermes claimed that the use of the *MetaBirkin* NFT would confuse customers and sued artist Mason Rothschild for developing the NFTs. Hermes claimed that the artist impersonated Birkin to produce digital replicas of the handbags, which she then allegedly sold for thousands

of dollars. The sold NFTs are not considered to be leather goods, even though Hermes owns trademarks for its leather goods, particularly its purses.

They are digital assets, and Hermes doesn't own a trademark for any of them. Since the NFT *MetaBirkins* are fur-covered and a social commentary, Rothschild claims that the first amendment protects his use of the brand. He further claims that using the Birkin trademark is an artistic expression that does not deceive the customers.

The Southern District of New York court declined the defendant's petition to dismiss on May 5, 2022, making it clear that the court will give an opinion on this matter. It is unclear if Hermes will win in the end.

Using NFTs as a counterfeit protection

Companies are starting to use NFTs to combat counterfeiting because they themselves cannot be replicated. NFTs' capacity to distinguish between the original digital copies and subsequent ones arises from practical considerations that can be complex. As a result, businesses and customers can use the blockchain to validate natively digital and tokenized physical assets.

With retail businesses, for instance, counterfeiting is a major issue. By tokenizing their physical goods with an official NFT that was specially created for each of them, buyers merely need to check the blockchain to verify authenticity.

With their *CryptoKicks* patent, Nike seems to be moving in this route (U.S. Patent No. 10,505,726). Buyer will also receive an NFT of their *CryptoKicks* linked to the real pair of shoes when they buy a physical pair of shoes. Nike and potential buyers can then use the NFT to verify the actual shoes' legitimacy and their passage through a legitimate chain of titles that started with Nike.

Right to Publicity

An individual's legal right to manage the commercial use of their name, image, likeness, or other parts of their identity is known as the right of publicity. The use of a person's likeness or picture on merchandise is one example of this, along with endorsements and sponsored content.

When an NFT is developed and sold to those features or is linked to a real-

world person without that person's consent, the right to publicity might become a problem. This might involve an NFT that is a perfect reproduction of a famous person's photograph or a digital portrait of someone made to look like them.

The IPR for the actual thing would also be considered if NFTs were to be used to represent ownership of tangible objects like collectible trading cards or other memorabilia.

Despite this, several platforms or NFT makers are looking for ways to expand usage rights and develop new kinds of NFTs, such as:

NFTs with smart contracts inside: these would allow utilization of the underlying work in particular ways or methods that can be set by the creator. Royalties paying these would provide the creator with a portion of every resale of the NFT.

The environment for NFTs and IPRs is still changing, and as the technology is more extensively used, it's conceivable that new applications and legal frameworks may appear.

The use of smart contracts is one way by which the right of publicity is being handled in the NFT sector. Smart contracts can be used to directly incorporate rights management data, such as who owns the rights to a person's picture or likeness and the circumstances under which it may be used, into an NFT. This can help to guarantee that an NFT that makes use of someone's likeness or image is only transferred or sold with that person's consent.

It is also crucial to keep in mind that different countries have different laws governing the right to publicity, and others may not even recognize it. When developing, selling, or trading NFTs that represent or are linked to real-world people, it is crucial to seek legal advice to make sure you are in accordance with local laws and regulations.

In general, it is wise to have approval and clearance from any specific people who are portrayed in NFTs.

Right of Privacy

Another legal principle that may be pertinent in the case of non-fungible tokens is the right to privacy. In general, it refers to a person's ability to

decide how their personal data is gathered, utilized, and shared by others.

When NFTs display pictures or videos of persons without their authorization or personal information that was obtained without their consent, the right to privacy might become a problem in the context of NFTs.

An NFT that, for instance, contains a person's name, address, or other contact information without that person's consent would probably constitute a violation of their right to privacy. Making an NFT that shows pictures or videos of people without their consent would probably be regarded as an infringement on their right to privacy.

It is crucial to remember that national laws governing the right to privacy vary and may have varied definitions of what constitutes a violation.

It is the best practice to obtain the approval of any individual whose personal information or photographs will be included in the NFT before making or exchanging it. The consent can be expressed by an agreement or a consent form and should be obvious and straightforward. It is advisable to seek legal advice if you are unsure whether an NFT you are developing or trading would violate someone's right to privacy.

The General Data Protection Regulation (**GDPR**) in the European Union, for example, provides certain rules and regulations for the collection, storage, and use of personal information, so it is vital to take note of these laws as well, depending on the jurisdiction.

Contracts

Non-fungible tokens (NFTs) are made possible via smart contracts, which enable the creation, ownership, and transfer of NFTs on a blockchain network. A self-executing contract known as a "smart contract" specifies the parameters of the agreement between the parties and enacts those provisions when certain criteria are met.

A smart contract can be used in the context of NFTs to represent ownership of the digital asset and to regulate ownership transfers between parties. The smart contract can be configured to incorporate several additional rules and guidelines that control how the NFT is used and distributed.

A smart contract for an NFT, for instance, can detail the privileges that come with ownership, such as the capacity to trade or sell the NFT or the capacity

to use it in specific ways. Additionally, information on royalties or other fees related to the NFT may be included in the contract.

Additionally, automatic payments of royalties or distributions to the NFT's author may be included in smart contracts for NFTs. When the NFT is sold, for instance, a smart contract might be put up to automatically pay the developer a portion of the sale price.

Smart contracts can also be used to make sure that the provisions of an agreement, such as the right to privacy and the right to publicity, are upheld. For instance, by incorporating right management data, such as who owns the rights to a person's picture or likeness and the circumstances under which it may be used, directly into an NFT.

In other words, smart contracts make it possible to create and operate NFTs in a safe and transparent manner, guaranteeing ownership and distribution rights and establishing precise guidelines for use and commercial exploitation.

Taxes

Non-fungible tokens (**NFTs**) may be taxed differently depending on the jurisdiction and the particulars of the transaction. In general, taxes like capital gains taxes, sales taxes, or **value-added taxes** (**VAT**) may apply to the sale or trade of NFTs.

The earnings from those sales may be liable to income taxes if an individual or company is purchasing and selling NFTs on a commercial basis. The profits from the sale may be liable to capital gains taxes if the NFTs are being sold as a capital asset, such as an investment.

Taxes on NFTs are handled the same way in some jurisdictions as taxes on other types of digital property, such as cryptocurrency. When sold for a profit in this situation, NFTs would be liable to capital gains taxes.

It is also vital to remember that sales taxes or VAT can apply to the purchase of NFTs. Depending on the legal system in use and the particulars of the transaction, this might change. Sales taxes, for instance, might in certain circumstances be applied to the entire value of the NFT while in other circumstances they might only be applied to a portion of the value.

To fully comprehend the tax ramifications of purchasing and selling NFTs, it

is crucial to speak with a tax expert with knowledge of digital assets given the range of potential tax implications. Additionally, to appropriately report any taxes owed, it is crucial to maintain thorough records of all transactions involving NFTs.

It is important to keep in mind that NFT taxes are a relatively new area of the law and that the legislation may differ, change, or even not exist in many countries. Therefore, it is crucial to stay updated and seek advice from specialists in this area to remain compliant with tax regulations.

Understanding the anatomy of NFT

An exclusive digital asset that resides on a blockchain network is known as an NFT, or non-fungible token. An NFT's primary elements are:

The actual digital asset: Anything from a piece of art to a film, audio file or tweet can fit this description. The digital asset can be saved on a decentralized file storage system like **Interplanetary File System** (**IPFS**) or Sia and is typically represented as a file, such as a JPEG or MP4.

The NFT itself, which is kept on the blockchain, is the token. The token functions as a kind of electronic ownership document for the digital asset. To differentiate the NFT from other NFTs, it has a special identifier known as a token ID.

The blockchain stores the smart contract, which is a self-executing contract. The NFT's rules and regulations, including information on how the token can be transferred, its present owner, and any other criteria pertaining to NFT ownership are contained in the smart contract**.**

Metadata: This is data that is related to the NFT but is not actually a part of the token. The title of the digital asset, the name of the artist or author, and a description of the asset are all examples of information that can be found in metadata. Additionally, information about royalties or other rights connected to the NFT may be included.

Transactions: Every time an NFT is transmitted, a transaction is recorded on the blockchain. This transaction includes the recipient's address, the sender's address, and the number of NFTs that were transferred.

A decentralized file storage system is used to store the digital asset and metadata when an NFT is generated, and the blockchain is used to deploy the

token and smart contract. Once the NFT is formed, it can be exchanged or purchased on a market, and the smart contract can be used to transfer ownership of the NFT.

It is important to keep in mind that different blockchain networks may implement NFTs differently and differ in how they store digital assets and metadata; some blockchain networks might not even store digital assets at all and instead simply maintain a hash of them.

Property rights of NFTs

The term *property rights* refers to the legal rights and privileges attached to property ownership, including the right to use, hold, sell, or transfer the property. Property rights in the context of non-fungible tokens can encompass both the rights to the NFT itself as well as the rights to the underlying digital asset, such as a work of art or a film.

Property rights can be complicated when it comes to NFTs because they aren't always well-defined or simple to uphold. The conditions of the smart contract that administers the NFT, the country in which it is being used, and the particulars of the transaction can all have an impact on the rights that come with holding an NFT.

The right to acquire and manage the NFT is known as ownership. Owning an NFT grants the possessor the sole authority to use and manage the underlying digital asset because NFTs are distinctive digital assets.

The following are examples of the property rights that come with owning an NFT:

- **Rights of resale**: The ability to resell the NFT to a different party. The ability to sell the NFT for a profit or to exchange ownership of the NFT for another asset falls under this category.
- **Licensing rights**: The ability to use the underlying digital asset in specific ways, such as making it available to the public or using it for profit.
- **Royalties**: The right to a portion of any future NFT sales proceeds or from the usage of the underlying digital asset for commercial purposes.

The owner of an NFT may not have all these rights, and the rights may be restricted or limited depending on the parameters of the smart contract. The

agreement might, for instance, contain a provision restricting the NFT's selling rights or requiring consent before using the underlying asset for commercial purposes.

Remember that copyright laws, trademark laws, and other intellectual property laws may apply to NFTs and the underlying digital assets. As a result, when working with NFTs, it's crucial to adhere to any pertinent laws, licenses, or agreements.

NFTs and digital property

The ownership of a digital asset, such as a work of art, a film, an audio file, or even a tweet, can be represented by non-fungible tokens (NFTs), a sort of digital asset. NFTs can be used to verify ownership and validity of digital property in a form that is tamper-proof, transparent, and verifiable because they are distinct and kept on a blockchain.

Smart contracts are used in NFTs to represent ownership of the digital asset and to regulate the transfer of ownership from one party to another. This makes it possible to purchase and sell NFTs on a market, just like you can do with actual assets.

The ability to establish a secondary market for digital assets is one of the major advantages of employing NFTs to represent digital property. This makes it possible to trade digital assets in a manner that is comparable to the buying and selling of physical goods.

It's also important to note that NFTs can be used to symbolize various types of digital property, including in-game items, virtual collectibles, and virtual real estate. This provides a new sense of ownership and scarcity to digital things while also opening new opportunities for authors and developers to monetize their digital works.

By eliminating middlemen and intermediaries and opening new avenues for monetization, the usage of NFTs also gives producers and makers the chance to connect directly with their audience.

While NFTs offer a means of representing digital property, it is crucial to remember that they do not necessarily alter or have an impact on the underlying copyright laws, trademark laws, or other intellectual property laws that may be related to the digital asset. As a result, when working with NFTs and digital property, make sure to adhere to any pertinent laws, agreements,

or licenses.

NFTs and real property

To represent ownership of digital assets like artwork, films, audio files, and other forms of digital media, **non-fungible tokens** (**NFTs**) are frequently employed. NFTs are not commonly used to represent ownership of physical property, such as real estate or buildings, even if they can be used to represent ownership of digital property.

NFTs are not generally utilized to represent ownership of real property for a few reasons:

- **Legal recognition**: Because NFTs are a relatively new technology, several jurisdictions are presently establishing their laws to recognize NFTs and other blockchain-based assets. Due to this, it may be challenging to utilize NFTs to represent actual property ownership in a form that is enforceable under the law.
- **Complexity**: Legal paperwork and procedures are frequently involved in real estate transactions, and these would need to be mirrored on the blockchain. This might make using NFTs to represent real property ownership more challenging and complicated.
- **Lack of necessity**: In most jurisdictions, real estate ownership is already well-established and recognized by law. There may not be an obvious need to utilize NFTs to represent real property ownership since there are already established processes in place for purchasing, selling, and transferring ownership.

Despite this, there have been some experiments and pilot projects that investigate the use of NFTs in real estate and land registries. These projects primarily take the form of tokenizing fractional ownership or representing land ownership rights on a blockchain, but they still require legal recognition, a more thorough approach, and wider adoption.

While NFTs are primarily used to represent digital property, they can also be used to represent other kinds of assets, such as shares in a company or membership rights in an organization, so it's important to keep in mind that it's not entirely improbable that NFTs will eventually be used to represent real property rights.

Metaverse

A virtual world or cosmos constructed on a decentralized and distributed architecture, such as a blockchain network, is referred to as the "metaverse." The term "metaverse" is used to describe a virtual world or universe where non-fungible tokens (NFTs) are utilized to represent ownership of virtual assets including in-game items, virtual collectibles, and real-world real estate.

NFTs can be used in a metaverse to represent ownership of digital items like 3D environments, digital art, virtual goods, virtual apparel and accessories, and other items that are made and utilized in virtual worlds and video games. As with actual goods in the real world, NFTs can be purchased, sold, and exchanged on marketplaces, establishing a secondary market for these digital commodities.

The metaverse is frequently referred to as a decentralized, independent virtual environment where users can connect, socialize, and do business. The metaverse is frequently viewed as uncharted territory for e-commerce, social interaction, entertainment, and perhaps even new business models. Blockchain technology's application in the metaverse enables a new degree of asset ownership, scarcity, and transaction transparency.

It is important to remember that the metaverse is still in its infancy and that infrastructure and technology are still being built. However, there is a great deal of interest in the metaverse's potential, and many businesses and organizations are making investments in the creation of NFTs and the metaverse.

In conclusion, NFTs are crucial to the metaverse because they offer a means of representing ownership of digital goods within virtual worlds and video games and they open up new avenues for developers, consumers, and artists to monetize and transact in these digital spaces.

Non-bankable assets

Assets that cannot be easily converted into cash or that are difficult to sell or trade on conventional financial markets are referred to as non-bankable. These resources may consist of real estate, fine art, or antiques.

The ownership of non-bankable assets can be represented by non-fungible tokens (NFTs), which also make it easier to buy and sell these assets in an

online marketplace.

An NFT might be used, for instance, to signify ownership of a unique work of art. Like how actual artwork would be purchased, sold, and traded in the real world, the NFT can be purchased, sold, and traded on a marketplace. Additionally, establishing an NFT for the artwork allows the designers and artists to financially benefit from the resale value of their creations, which may not have been possible with physical art in the past.

In-game items, virtual real estate, virtual collectibles, and other non-bankable assets can all be represented as ownership by NFTs. Smart contracts can be used to transfer and trade ownership of these assets, enabling the development of a secondary market.

It is vital to remember that NFTs just offer a mechanism to tokenize and trade an asset on a digital platform; they do not alter the asset's fundamental worth. NFTs can also make the purchasing and selling of non-bankable assets easier, but not all countries recognize them as legal property ownership, thus it is necessary to check local rules and regulations before making a purchase or a sale of an NFT that represents a non-bankable asset.

Digital wallets

A digital wallet is a piece of software used to store and manage digital assets on a blockchain network, such as cryptocurrencies or non-fungible tokens (NFTs). NFTs can be stored, sent, and received using digital wallets, and they can also be used to communicate with the smart contracts that control NFT ownership and transfer.

In terms of NFTs, a digital wallet can be used to store, examine, and manage your NFT holdings as well as the underlying digital assets they stand for. Using a digital wallet for NFTs can help you accomplish things like:

- Viewing your collection of NFTs: You can view all the NFTs you have, along with any underlying digital objects like images or movies.
- Sending and receiving NFTs: NFTs can be sent to and received from other users.
- Managing NFT rights and conditions: You can examine and control the NFT rights and conditions, including the NFT's ability to be sold or traded, as well as the conditions that apply to how the underlying digital

asset may be used.

- Trading and selling NFTs: You can check details of previous transactions and purchases as well as trade and sell NFTs on online markets.

Digital wallets for NFTs are typically offered as web-based applications that can be accessed using a web browser or as software programs that can be downloaded and installed on a desktop computer or mobile device.

Make sure your digital wallet is compatible with the blockchain network when selecting one for your NFTs.

Conclusion

In conclusion, it is yet unclear what the legal implications of NFTs will be, and they probably depend on the jurisdiction. The question of whether NFTs are regarded as a form of property, whether they are seen as securities, and the copyright and other intellectual property rights connected to the digital assets represented by NFTs are some important legal concerns that have been identified.

We can anticipate seeing more rules and guidance about the legal status of NFTs in the future as governments, regulators, and other stakeholders pay this issue greater attention.

Despite the legal ambiguities, NFTs have a bright future because they have the potential to alter our perceptions of ownership and the way we market digital artwork, collectibles, and other special digital goods. The use cases for NFTs are anticipated to rise as blockchain technology continues to develop and progress, which might be a game-changer for the market for digital art. To fully take advantage of the possibilities that NFTs provide, it is crucial for both makers and consumers to be updated about the legal advancements in this area.

Key terms

- **Securities:** A financial instrument that symbolizes a share of ownership in a publicly traded company (stocks) or a debt obligation owed by a company or government (bonds).
- **Regulation:** A system of rules and regulations established by a

government or other body to manage and oversee a certain activity or business.

- **Intellectual property (IP):** It is the legal term for mental works, including inventions, literary and artistic productions, as well as names, symbols, pictures, and patterns utilized in commerce.

Multiple Choice Questions

1. **What kind of technology is used to register and store NFT ownership?**
    a. A physical ledger
    b. Decentralized digital ledger
    c. Centralized digital ledger
    d. None of the above
2. **What distinguishes NFTs from cryptocurrencies?**
    a. NFTs are not securities.
    b. They are fungible digital assets that can only be used to buy physical products.
    c. They are unique digital assets.
    d. None of the above
3. **What is one of the key legal issues about NFTs?**
    a. Whether or not they are regarded as a form of property
    b. Whether or not the person who created an NFT has transferred their rights to the NFT buyer
    c. Wheter or not they are regarded as legal tender
    d. None of the above
4. **Why are regulators and the government devoting more attention to NFTs?**
    a. To limit the value of NFTs
    b. To establish rules and regulations for their usage and trade
    c. To stop their use for criminal activities

d. Noneof the above

5. **What possible effects might NFTs have on the art and collectibles market?**
    a. It might make it more difficult for creators and collectors to commercialize their work.
    b. It might create new opportunities for them by making it simpler for them to sell their original works of digital art and for collectors to buy and collect them.
    c. Art museums might close as a result.
    d. None of the above

Answers

1. **d**
2. **a**
3. **a**
4. **b**
5. **c**

Join our book's Discord space

Join the book's Discord Workspace for Latest updates, Offers, Tech happenings around the world, New Release and Sessions with the Authors:

https://discord.bpbonline.com

Index

A

account
  creating 220
  funding 220
Alcor Exchange 174
Alpha wallet 84
Anti-Money Laundering Act (AMLA) 134, 135
antiques
  insurance 58
  versus, collectibles 58, 59
assets, security 211
  hack, protecting against 211, 212
  NFTs, stealing 212, 213
  stolen NFT, recovering 214, 215
  theft, preventing 213, 214
  tips 212
asset tokens
  benefits 32
  purpose 32
AtomicMarket NFT marketplace 171
Australian Taxation Office (ATO) 134
Axie Infinity 96

B

BAYC 6
Beeple NFT 6
Binance 177
  NFT fees 179
  NFTs 178, 179
Bitcoin (BTC) 33
blockchain 122
blockchain denial-of-service (BDoS) attack 203
blockchain-related issues 200-202
Bored Ape Yacht Club (BAYC) 245

C

Capital Gains Tax (CGT) 134
Coinbase wallet 85, 86
collectible investing
  benefits 59
  drawbacks 59
collectibles 57, 58
  consequences of investing 61, 62
  examples 60, 61
  insurance 58
  problem 61
  selling 61
  versus, antiques 58, 59
Commodity Exchange Act (CEA) 132
Commodity Futures Trading Commission (CFTC) 132, 242
COMP tokens 28
computer art 63
consumer law 135
Corporate Transparency Act (CTA) 135
crypto
  ABCs 124
  versus, NFTs 123-125
Crypto Asset Provider 26
crypto assets
  examples 28
Crypto.com NFT 176, 177
cryptocurrencies 3
CryptoKitties 3, 74, 75
  breeding 76
  buying 76-80
  buying, considerations 75, 76
  buying offer 76
  selling 76
  siring 76
  working 75
CryptoPunks 6
crypto tokens
  structure 28
  working 27
crypto wallets 130
  hardware wallet 89
  hosted wallet 87

non-custodial wallet 88
self-custody wallet 88
setting up 87

D

data tampering 209
risk 210
types 209, 210
Decentraland 7
Decentralized Autonomous Organization (DAO) 29
DeFi tokens 28
denial-of-service (DoS) attack 202, 203
example 204
digital art 63, 64, 72
advantages 72-74
disadvantages 72-74
history 71, 72
purpose 72
digital tokens 26, 27
translating, into real money 30
digital wallet 80, 81, 254
closed wallet 82
importance 81, 82
open wallet 82
semi-closed wallet 82
Distributed denial-of-service (DDoS) attacks 202

E

elements, NFTs
community 10, 11
meaning 9
scarcity 9
EOSIO 44
equity token
benefits 31, 32
usage 31
ERC20 standard 3, 40
ERC-20 token 49
basic code functions 50
burn functionality 49, 50
ERC721 standard 4, 42

ERC-777 standard 43
ERC1155 standard 43
ERC token standards 40
Ether (ETH) 34
Ethereum Request for Comment (ERC) 39
Ethereum token 48
e-wallet 80

F

Foundation 175
fungible tokens 33, 34
  versus, non-fungible tokens 36-38

G

General Data Protection Regulation (GDPR) 248
governance tokens 28

H

hardware wallet 89
  setting up 89
High-Net-Worth Individuals (HNIs) 126
hosted wallet 87
  setting up 87, 88

I

information leakage 207
  private keys 208
  security flaws 208, 209
Initial Coin Offering (ICO) 26
Inland Revenue Department (IRD) 134
intellectual property 133
intellectual property rights (IPR) 136, 244, 245
  NFTs, as counterfeit protection 246
  possibility, of forging NFTs 245, 246
Internal Revenue Service (IRS) 133
Interplanetary File System (IPFS) 249

L

Ledger Nano X 192

M

Magic Eden 177
  launchpad 177
  popular collections 177
  upcoming launches 177
marketplace
  using 224
  wallet, connecting 225, 226
  wallet, setting up 224, 225
Math wallet 83, 84
MetaMask 15, 83, 97
  alternatives 105
  benefits 104
  drawbacks 105
  installing 107-112
  news, in 2022 106, 107
  prospects 105
  risk 105, 106
  secure program 106
  securing 115, 116
  seed phrase, for backup and restore 115
  usage guide 113, 114
  using 98-104
MetaMask Secret Recovery Phrase 224
metaverse 252, 253
Minting Fees 20
Multi-factor authentication (MFA) 191

N

NBA Top Shot 171, 172
Net Art 63, 64
NFT investments profit 145, 146
NFTs games 93-95
  Axie Infinity 96
  in-game 96
  NFT collections, on Binance 97
  play-to-earn 95
  popular games 96
  revenue model 96

Sorare 96
unchained Gods 97
working 95
NFTs Marketplaces 150-153
creating 159
features 153, 154
important spots 154, 155
specifications 156, 157
tips for selecting 179, 180
types 159-161
working 158
NFTs securities 183-185, 240, 241
China 243, 244
hardware and cold crypto wallets 192
Hong Kong 243
possible threats 189, 190
safety ratings 186-189
software and hot storage crypto wallets 192
solutions 190-192
United Kingdom 242, 243
United States 241, 242
working 185, 186
NFTs, types
artwork 5, 6
collectibles 6
domain names 7
memes 7
sports memorabilia 6
video-game assets 7
virtual land 7
NFT trading strategies 142-145
NFT wallets
Alpha wallet 84
benefits 86
Coinbase wallet 85, 86
considerations 86, 87
Math wallet 83, 84
Metamask 83
Trust wallet 85
Nifty gateway 172, 173
non-bankable assets 253
non-custodial wallet
setting up 88

non-fungible tokens (NFTs) 1-3, 33-35, 54, 120-221
advantages 64, 65
anatomy 249, 250
as commodities 132
as intellectual properties 133, 134
as securities 132
beginning 66
buying 15, 16
characteristics 4
colored coins 67
cons 17, 18
contracts 248
counterparty 2014 67
creating 16, 227
CryptoPunks, in 2017 68
digital property 251
elements 9
explosion, 2018-2021 68, 69
features 4, 5, 122, 123
future 193
history 66
importance, in bitcoin world 55-57
invention 66
investing in 126-139
investing strategies 140, 141
investments 18, 19
journey 19-21
legal issues 131
listing, on OpenSea 227-234
listing, on Rarible 234, 235
minting 223
money making with 141, 142
opportunities 8
ownership of real property 252
ownership rights 14
property rights 250
pros 17
rare pepes, on counterparty 2016 67
regulated usage 130, 131
regulation laws and standards 134-141
regulatory challenges and concerns 131
selling 17, 221, 222
selling platform, selecting 222, 223

spells of genesis, on counterparty 2015 67
taxation aspects 131
taxes 249
technical aspects 19
trading 15
trading cards, on counterparty 2016 67
types 5
usage 11-13
using 235
versus, crypto 123-125
versus, fungible tokens 36-38
working 14

O

OpenSea 161-163
NFT, creating 163-166
NFT, listing on 227-234
NFT, selling with 166-169
ownership of real property 252
complexity 252
lack of necessity 252
legal recognition 252

P

Polygon 223
Proof-of-Stake (PoS) 47
Proof-of-Work (PoW) 47
property rights 250
examples 250, 251
Pure Proof-Of-Stake (PPoS) network 160

Q

Quoth 135

R

Rarible NFT marketplace 169, 170
NFT, listing on 234, 235
reentrancy 194
re-entrant attack 193, 194

preventing, with modifier 200
scenario 197-199
significant problem 197
smart contract reentrancy attacks 195, 196
smart contracts, protecting 199
working 197
right to privacy 247, 248
right to publicity 246, 247
Roc-A-Fella Records 136

S

Securities and Exchange Commission (SEC) 241
security tokens 29
self-custody wallet 88
Selling Fees 20
Small Love Potions (SLP) 96
smart contract 248
smart contract for reentry
advantage 196
example 195, 196
Smooth Love Potion (SLP) 95
Snoop Dogg 8
Sorare 96
spoofing 205, 206
SuperRare 173

T

tampering 209
data tampering 209
taxes 249
technical aspects, NFTs
blockchain technology 19
cryptography 19
digital wallets 19
interoperability 19
token standard 19
Tezos 46
liquid democracy 47, 48
open participation 47
smart contracts 47
token standards 45

upgradability 46
Tezos Interoperability Proposals (TZIP) 45
tokens 26
definition 27
significance 32, 33
versus, cryptocurrencies 34
tokens, in financial business
asset tokens, using 32
equity tokens, using 31
example 31
importance 31
potential threat 31
token standards 38-40
ERC20 40
ERC721 42
ERC777 43
ERC1155 43
for other blockchains 44, 45
token standards, for Tezos 45
Top Shot 171, 172
transferFrom() function 41
Trezor 192
Trust wallet 85

U

Ultra-High-Net-Worth Individuals 126
utility tokens 30

V

value-added taxes (VAT) 249
VeVe 176

W

Warhol, Andrew 69
WAX 174